FOOD INDUSTRIES

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National Land Policy Needed

IF A SURPLUS is that amount of goods or services which we do not need ourselves and cannot sell for profit or satisfaction, then as soon as a surplus is created it ceases to be an asset and takes on the aspect of a liability. When it is worth less than it cost, when it cannot be exchanged for what we want, what good is it? The owner does not want it, cannot use it, and the buyer refuses to pay a profit-yielding price. He does not need to!

● YET we have heard otherwise intelligent men decry the destruction of surplus coffee in Brazil, demand export debentures, and propose still further expansion of our national agricultural lands through ridiculous, uncalled-for irrigation projects, such as the Columbia Basin and the Baker projects.

● THE FEATURE of present-day affairs which receives too little thoughtful attention is the nature of the surpluses which characterize this depression. They are all agricultural. There is too much sugar, too much wheat, too much coffee, too much cotton, too many peaches, too much corn, too many swine, too much rubber, too many salt pickles, too much milk, too much lard, too much cottonseed oil. Outside of oil and copper, there seem to be no non-agricultural commodity surpluses.

● ALSO there is too much unalloyed buncombe regarding these surpluses, indicative of the fact that their proponents are still indulging in that dear old human practice: hopeful wishing.

● WHOEVER states that the troubles of our day are due to faulty distribution is uttering only a half truth. There are those economic nitwits who actually demand the continued production of surpluses by demanding the aid of government to keep them coming. They demand export debentures to foster more overproduction, tariffs, and anti-trust laws, forgetting or ignoring the fact that a surplus is a surplus, no matter who happens to be its owner.

● IF THERE are two things that this country does not need, they are more farm lands under cultivation and more food surpluses. Our national agricultural plant is today large enough to take care of our future needs until everyone who reads these words in 1932 will have been dead for fifty years. As long as our mode of life is mainly to produce things which we as individuals do not want, in order to exchange them for other products, we must be very sure that somebody else wants them, or they are of no value to the producers.

● IN OUR state of society, where there is specialization of labor, anyone who produces more food than society needs is actually harming his fellow man by curtailing his own buying power.

● AS LONG as agriculture continues almost to give its produce away, it cannot hope to sell it at a profit. We commend to our readers some very earnest thinking on this subject. A national agricultural land policy must be formulated and put into effect. And unless it is done within a very few years it is easy to foresee the future trend. Paradoxically, the back-to-the-land movement, instead of ceasing, will grow in vigor. And who then will purchase the products of urban industry?

...AS IT LOOKS TO US

Bad Tariffs

Americans upbraid Congress for tariff tinkering but shut their eyes to local internal tariffs of dubious wisdom. Our foreign commercial policies are not one whit wiser than our internal policies. America's best customer is not a foreign land but our own people, yet we are setting up domestic trade barriers that are no less iniquitous than barriers to foreign trade, and are capable of exciting equally vicious retaliatory measures. And once set up, they will be everlasting!

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Dangerous Compulsion

The South—once our $1,000,000,000 market—is endeavoring to rehabilitate itself by diversified agriculture. Corn-belt legislators will be wise if they oppose all moves to embargo cottonseed oil products which compete with pork products. Dairy states likewise should support moves like the Kleberg Bill which will exempt from the 10-cent federal tax all margarine made solely from domestic fats and oils. No policy is more dangerous than that of *compelling* a competitor to duplicate your products or facilities. The South *can* produce its own butter if it is driven to do it.

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Package Redesign

Before redesigning packages it is important to confer systematically with research departments of supply makers, particularly of closures, containers and filling machines. In this way it is possible to take advantage of standard equipment and processes, as well as to avoid expensive or impossible special jobs. Remember that packaging is still done in the factory; not in the studio or the office.

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When Research Pays

When steered by competent management, good research usually pays handsome profits, but only where management knows how to play its hand. Winning cards can be provided by the development department. Management must know what to specify in order to win. Then research develops the necessary low costs, new uses, better qualities, better packaging, improved flavor. Profits can come from skillful team work. Ideas, undeveloped or unsold, are never reported in a P. & L. statement.

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Noisy

Intense sound waves may yet be utilized by the dairy or bottled juice manufacturer as a bactericidal agent. According to Chambers and Gaines, in May *Milk Plant Monthly,* their apparatus, with a capacity of 100 quarts per hour, uses 750 watts of electrical energy without causing an appreciable rise of temperature and reduces the bacterial count by 80 per cent. Still in the laboratory, it holds interesting commercial possibilities for pasteurizing heat-sensitive liquids of low viscosity. Wonder how sonic pasteurization sounds.

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Inert Gas—Again!!!

So someone is going to preserve perishables in an inert gas near Toledo. If we had all the money that has been wasted trying to stop microbial and enzymatic activity by an inert gas, we'd think we were really rich. W. J. Howey tried it in Florida last year with carbon dioxide, and nine carloads of oranges became soup, which was secretly dumped. Three years ago it was tried in Hammonton, N. J., and after that—shrieks of silence.

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Suckers

Many a rich man becomes a financial angel for strange food business. Read on and weep! A successful building contractor has just purchased the controlling interest in a specialty food plant that has been a four-year headache. Except for absorbing cash from its backers, it has never amounted to a whoop. A successful real estate promoter last year was inveigled into a costly but technically and scientifically impossible venture in food preservation that cost him $30,000—perhaps even more. Recent callers at this office were about to put large sums of money into "new and revolutionary" food manufacturing enterprises. One was the dehydration of vegetables and the other, pectin manufacture! Can you beat it? Can you even approximate it? Why does not the would-be investor hire a consulting chemist or consulting food engineer?

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Use Trade Acceptances

Even if overcautious banks refuse legitimate credit accommodations, a manufacturer can purchase needed supplies or equipment by the use of the trade acceptance. Sales also can be financed in the same way. This old financial instrument, which falls into disuse in days of prosperity, should now be put to work again. Where goods are normally sold on longer than 30 days' time, the trade acceptance can best be utilized.

Procedure: Seller's trade acceptance accompanies the invoice; buyer accepts (or pays cash and takes discount), returns invoice and acceptance for receipt; seller indorses acceptance and banks it; bank rediscounts the acceptance at Federal Reserve Bank, which sends it to the designated bank for collection at maturity. The buyer then pays the acceptance, and the deal is complete. For detailed information write the American Acceptance Council, 120 Broadway, New York, N. Y.

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Helping Business

Orders to suspend future trading on the Chicago Board of Trade on Aug. 8, unless its governors admit error and promise to be good, is but another example of the pathetic errors of man. Broadly speaking, the movement had its origin in the Grain Futures Act of 1922. Later, with world-wide surpluses of foodstuffs, the Agricultural Marketing Act created the Federal Farm Board to finance, in effect, continued overproduction. And now, because a cooperative will not abide by the rules of the largest grain market in this hemisphere, the government orders that futures are to be suspended for 60 days. Thus by closing markets we achieve general prosperity.

WHY FEAR Prohibition REPEAL?

By E. SCOTT PATTISON
New York, N. Y.

When this baker entered the New York Beer Parade, he left no doubt about his views on repeal; he even broadcasts it.

FROM an economic standpoint, the prohibition question undoubtedly is the world's worst victim of statistical delirium tremens. We have, for example, Prof. Irving Fisher, economist at Yale University, asserting that the benefits of prohibition are worth from three to ten billions of dollars a year[1]. And we have Matthew Woll, vice-president of the American Federation of Labor, testifying that since its enactment, the Eighteenth Amendment and its enforcement acts have cost the country over 25 billions.[2] For the past twelve years, then, estimates have varied by as much as 145 billions of dollars—about three times the total United States internal revenue receipts, from liquor taxes, income taxes and all other taxes, since the year 1800—more than the total money cost of the World War to all nations involved.

It must be admitted at the outset that we do not know, and probably never can know, the ultimate economic effect of the manufacture, legal or illegal, of alcoholic beverages. Still more difficult to ascertain would be the economic effect of total prohibition in fact as well as in law. So interrelated with our whole ever-changing economic mechanism is the question that many of the points which have been raised in so-called serious economic studies are comparable to including, in an analysis of the chewing gum industry, the labor required in scraping the bottoms of soda fountain stools. Many of the penetrating statements, closely examined, are found in the same class of economic theory as analyses of the automobile industry which seek to show that the total energy consumed in aimless Sunday driving could irrigate enough of the Sahara to provide self-supporting farms for the total population of Detroit. They include everything but the fact that residents of Detroit have no desire to farm the Sahara, and would not go there on a bet. The analogy to prohibition seems clear.

If we are to reach any conclusions at all, we must limit this discussion, quite dogmatically, to primary economic effects. Crime and cirrhosis of the liver are beyond its scope. Briefly, the primary economic considerations are these: How much new industrial activity would be brought into being by prohibition repeal? How great would be the competitive losses of other legitimate industries now engaged in the struggle for a share of the national income? Would the balance be positive or negative?

Much has been made of the increased government revenues that would be made possible by taxation of liquor, but they do not figure in these primary questions. Fundamentally, we must remember, such revenues are a "split" for the right to direct the expenditure of a certain portion of the national income between the population as individuals and the population as a collective unit, or government. For a certain national income, the *size* of the split alone determines the proportion which individuals have left to spend for the products of industry, whatever the method of securing the split may be. The amount of money going from individuals directly back into industry is lowered just as much by high taxes on alcoholic beverages as by general sales taxes, or any other kind, if the total is the same.

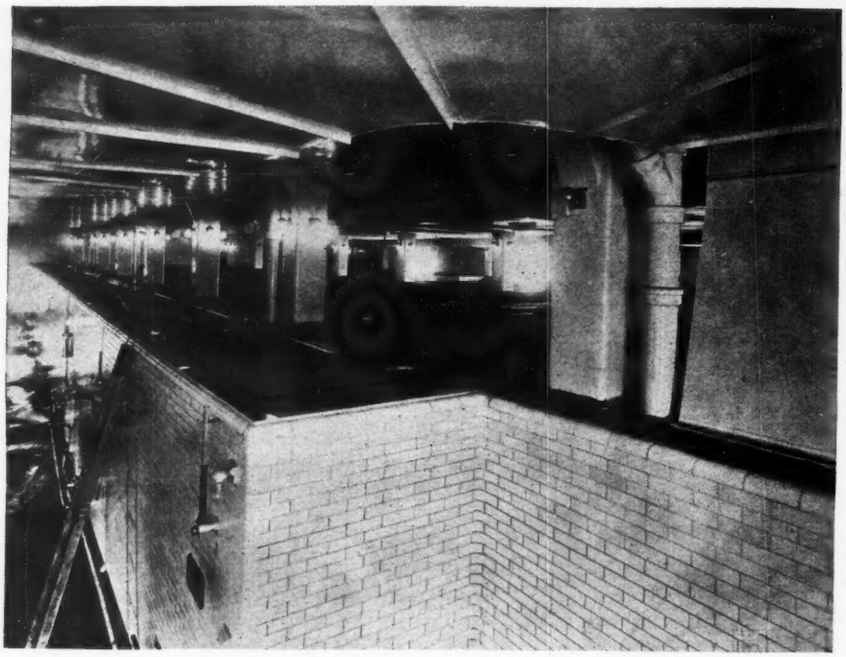
All this economic hairsplitting is really most vital to our analysis, because of the general feeling that a high tax on alcoholic beverages, returning up to a billion dollars a year to the national treasury, would be pure gain taken out of the pockets of bootleggers. The industrial benefits of a revival of the legal liquor industry, however, depend upon an increase in its own revenues, not in the government's. Other industries may see a sure relief from a grievous tax burden should alcoholic beverages return, but they will still be competing with government for the national income to the same degree. In other words, the increase in legitimate industrial activity per dollar expended for alcoholic beverages is the real gain—the increase in government revenue per dollar expended for alcoholic beverages is merely a shift in the means by which the government's inevitable share of the national income is secured.

But to get back to our first fundamental question: "How much new industrial activity would be brought into being by prohibition repeal?" The first difficulty that arises is that we must begin with some estimate, or "guesstimate," of what post-prohibition consumption would be. The universal practice has been to assume some "return"

Table I—Consumption of Alcoholic Beverages, 1900 to 1920 Inclusive

Year	Per Capita Consumption—Distilled Spirits, Proof Gallons	Wines, Gallons	Beer, Gallons	Year	Per Capita Consumption—Distilled Spirits, Proof Gallons	Wines, Gallons	Beer, Gallons
1920	0.26	0.12	2.45	1909	1.32	0.67	19.04
1919	0.77	0.51	8.00	1908	1.39	0.58	20.23
1918	0.85	0.49	14.87	1907	1.58	0.65	20.53
1917	1.62	0.41	18.17	1906	1.47	0.53	19.51
1916	1.37	0.47	17.78	1905	1.41	0.41	17.99
1915	1.26	0.33	18.40	1904	1.44	0.52	17.88
1914	1.44	0.53	20.69	1903	1.43	0.47	17.64
1913	1.51	0.56	20.72	1902	1.34	0.62	17.15
1912	1.45	0.58	20.02	1901	1.31	0.36	15.95
1911	1.46	0.67	20.69	1900	1.28	0.39	16.06
1910	1.42	0.65	19.77				

From statement of Amos W. Woodcock, Director, Bureau of Prohibition, hearings on the Bingham beerbils (S.436 and S.2473), page 343.



Open glass-lined fermenting tanks in Jacob Ruppert's Brewery. Note how the sanitary pipe and fittings, and white tile suggest a fine dairy.

to a pre-prohibition figure. But the situation has been complicated by the fact that these return assumptions sometimes go back to former per-capita consumption; sometimes to former total volume of consumption; sometimes to total, or to per-capita, total expenditure figures.

We must keep clearly in mind that a "return"—if any return is necessary—to any assumed pre-prohibition *volume* does not necessarily mean a return to the same pre-prohibition *expenditure,* and vice versa. Table I, for instance, shows variations of considerable magnitude in per-capita consumption, due largely to variations in sales restrictions and taxes. From 1917 to 1918, the per-capita consumption of beer dropped from 18.17 gal. to 14.87 gal. Federal taxes on beer in the same period rose from 90 to over 126 million dollars[3]. Obviously, how alcoholic beverages return, if and when they do, will mightily influence the consumption and expenditure figures that result.

It is apparent too that what may be called intra-liquor-industry competition, a factor of decided significance in the industrial importance of the industry, will be controlled by government sales restrictions and taxes. How much beer will be bought, and how much distilled liquor, will depend upon where each may be sold, and the relative price as determined by taxation.

Realizing these limitations, however, we may find it of value to consider where some of the pre-prohibition expenditures for alcoholic beverages went. In 1913, the year of peak liquor production in the United States, the total retail drink bill was estimated by the *American Grocer* at $1,817,000,000.[4] Now this $1,817,000,000 may have been "squandered in riotous living," but it did not pass off the face of the earth. Federal tax returns that year show that $158,068,907 was collected on distilled spirits and $65,254,544 on beer and wine. Over 12 per cent, then, was not strictly "expended" at all, but simply passed over to the government for expenditure in a totally different field.

Incidentally, in 1919, when federal tax figures were at their maximum, this amount was more than doubled, and the federal government received a total of about $480,000,000. Table I shows the effect of this situation upon consumption figures.

But to go back to our 1913 figures, when local as well as national taxes have been deducted, the net drink bill—the amount that actually went to the liquor industry—was $1,474,000,000. It purchased at retail 142,894,502 gal. of distilled spirits[5] and 2,025,071,156 gal. of fermented beverages. On a per-capita basis (see Table I) this equalled 1.51 gal. of distilled spirits, 0.56 gal. of wine, and 20.72 gal. of beer.

The part of the billion and a half that was passed back to agriculture for raw materials for distilled spirits paid for the following:[6]

Malt, bushels	4,252,583
Wheat, bushels	2,756
Barley, bushels	1,225
Rye, bushels	5,828,450
Corn, bushels	23,847,875
Molasses, pounds	65,640,976
"Other Materials," bushels	98,139

Raw materials used in fermented liquor (beer) were not compiled in 1913, but in 1915, when consumption was about 10 per cent lower, purchases were as follows:

Malt[1], pounds	2,141,732,104
Rice, pounds	167,750,177
Corn and corn products, pounds	604,890,910
Hops, pounds	38,839,294
Sugar and syrup, pounds	109,630,425
"Other grains," pounds	145,697,970
"[1]Other materials" (salt, yeast, etc.,) pounds	68,880,530
Total, pounds	3,277,412,401

[1]Equivalent to 59,408,459 bu. of barley.

Totaling about 3 per cent of the national grain crop, the agricultural raw materials for distilled spirits and beer have been estimated as the average yield of 7,000,000 to 10,000,000 acres. Transportation of these materials, some 300,000 carloads, took more of the $1,474,000,000. It kept 1,462 breweries and 870 distilleries operating. The Census of Manufactures in 1914 showed 8,300 employed in distilleries, 78,000 in the production of malt and beer, 3,000 in wine production. Payrolls of those directly employed in manufacture aggregated $92,756,047. The brewing industry in 1914 represented a capital investment of $839,631,000. The last pre-prohibition estimate of total employees, including makers, distributors, bartenders, and the like, is given in the Year Book of the U. S. Brewers' Association for 1914. It lists 498,906 employees, of which 250,482 were engaged in retailing.

Estimates of many other fields into which portions of the $1,474,000,000 were passed have been made[7], but definite figures are unavailable. These include the cooperage industry, bottle making, the manufacture of brewery and distillery equipment, and the like. The Anti-Saloon League estimated in 1918 that the brewing industry alone, from June, 1916, to June, 1917, consumed 3,220,000 tons of coal. Part of our $1,474,000,000, of course, went to the men who mined and transported it. The refrigerating industry benefited to a considerable degree. A pre-prohibition

Table II—Estimated Possible Production of Illegal Liquor in United States, Year Ending June 30, 1930

	Proof Gallons
Distilled spirits from corn sugar	45,900,000
Distilled spirits from cane or beet sugar	10,000,000
Distilled spirits from grains	4,000,000
Diverted industrial alcohol	9,929,218
Smuggled spirits	3,557,500
Total spirits	73,386,718
Wines made from grapes and raisins	118,320,300
Smuggled wine	155,900
Total wine	118,476,200
Malt liquors (home brew)	683,032,000
Malt liquor smuggled	1,444,800
Total malt liquors	684,476,800
ALL BEVERAGE LIQUOR	
Spirits	73,386,718
Wine	118,476,200
Beer	684,476,800
Total possible production	876,339,718

From statement of the Bureau of Prohibition Enforcement of the Department of Justice, September 1930.

edition of the Ice and Refrigeration Blue Book listed 1,265 breweries equipped with refrigerating machinery having a capacity of 172,871 tons. The 1928 edition lists 560 non-alcoholic cereal beverage plants with a capacity of 81,719 tons.

Present Volume and Cost of Liquor

The crux of the whole question, however, before we can make any assumption as to the effect of "post-repeal" volume or expenditure, hinges around present volume, and particularly present expenditures, for illegal beverages. Illegal liquor obviously is the first thing that legal liquor can be expected to replace.

As a matter of fact, present consumption is no less a factor in the possibility for industrial increase than it is in the competitive aspect with foods or other products. A bottle is a bottle and a cork a cork, whether it be made for legal or illegal purposes.

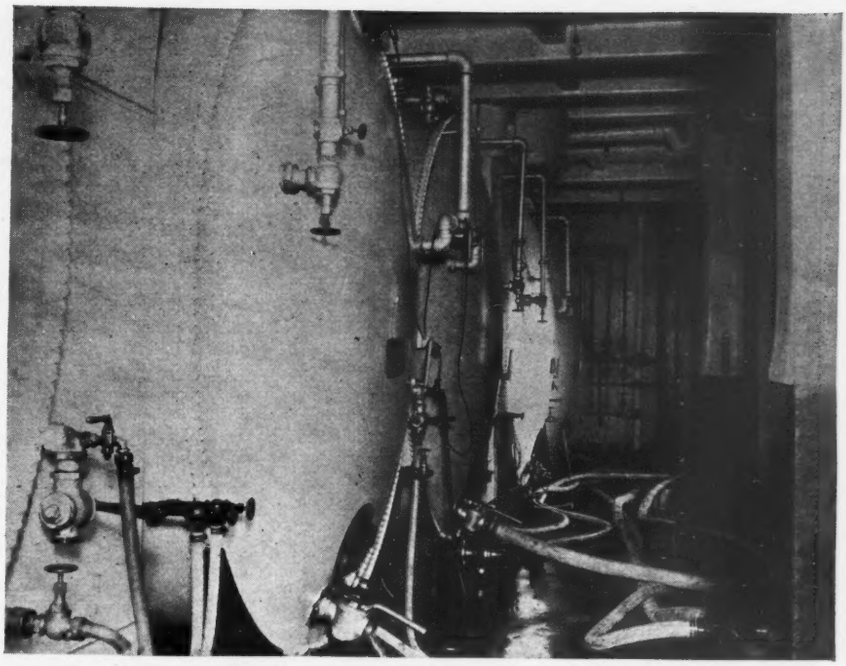
Practically every survey of present consumption begins with the Prohibition Bureau's famous estimate of production for the fiscal year ending June 30, 1930 (see Table II). For beer and wine consumption, the figures do not vary widely from those compiled by the Association Against the Prohibition Amendment, nor from those presented by Representative William H. Hull to the Senate subcommittee at the hearings on the Bingham Beer Bill (see Table III). Even the government figures show that wine production is now considerably higher than it was in pre-prohibition days.

It can be assumed without reasonable doubt from these sources that the total consumption of malt and vinous beverages is now at least 50 per cent of the ten-year pre-prohibition average. Industrial gains of legal manufacture of such beverages, therefore, cannot be measured on a basis of total volume of legal production, for 50 per cent will be replacing illegal beer and barely legal wine now being manufactured. As an industrial stimulant, however, the advantages of legal manufacture are not cut to this percentage, because much of the equipment and labor for the present volume of production is supplied in the home. Any shift of manufacture out of the home is a clear industrial gain offset only to a small degree by the present trade in home-brew materials and supplies.

Table III—Estimate of Illegal Liquor Consumption, Year Ending June 30, 1930

	Total Consumption, Gallons	Per Capita Consumption* Gallons
Malt liquors (not including cereal beverages)	775,000,000	6.31
Wines	107,517,995	0.87
Distilled spirits	285,871,200	2.328
Total	1,168,389,195	9.508

*Based on 122,755,046 of population, latest Census Report.



Closed storage tanks 100x10 ft. The brewers are masters at handling liquids, and their knowledge of how to use rubber hose can well be adapted by other manufacturers.

When we come to present consumption of distilled spirits, we find an irreconcilable disagreement between estimates. The 73,386,712 gal. given as possible consumption in figures of the Prohibition Bureau is less than a third of other estimates (Table III) based on reasoning that does not seem so unsound that the discrepancy can be charged entirely to prejudice. A careful evaluation of the relative accuracy of source material between four of these estimates leads to a composite "guesstimate" of about 100,000,000 gal. Although about 25 per cent above Col. Woodcock's figures, this is just half the estimate of the Association Against the Prohibition Amendment. It certainly must be considered as conservative.

Now we are forced to make another supposition: What is the cost of these illegal beverages to the consumers? Until we determine this, we are in no position to consider how much money might be diverted from food industry, or any other industry, back to liquor upon repeal of the Eighteenth Amendment.

The following retail price estimates for 1930 have been widely quoted and never held seriously in error; at least, not from the standpoint of being too high[3]:

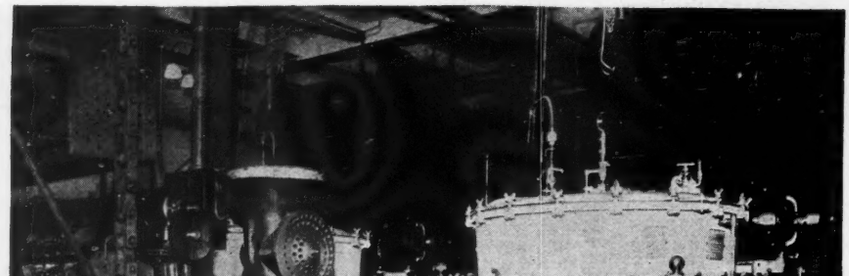
Spirits, per gallon	$11.00
Wine, per gallon	2.30
Beer, per gallon	0.50

In each case, these figures are a compromise between high speakeasy prices and low home-manufacture prices. The cost of making home brew, for instance, is about half the $0.50 per gal. figure, but it must be balanced against the $4 per gal. "on draught" price in the speakeasies. Those favoring prohibition have boasted of the high price of illegal liquor as a real achievement. Irving Fisher, asserting that consumption has dropped 75 per cent, says that prices have risen three to seven times because of the prohibition law.[1] On that basis alone, present expenditures for liquor are at least equal to, and possibly twice, the pre-prohibition figure.

Turning back to our own estimates, we can make a closer analysis of liquor expenditures under prohibition:

	1930 Gallonage	Cost per Gal.	Total Cost
Beer	684,000,000	$0.50	$342,000,000
Wine	118,000,000	2.30	271,000,000
Spirits	100,000,000	11.00	1,100,000,000
Total	902,000,000		$1,713,000,000

From a competitive standpoint, the significance of these figures lies in the fact that, although total gallonage may have dropped more than one-half, the actual expenditures for intoxicants in 1930 appear to exceed those in the peak consumption year of 1913. The net drink bill of the latter year (deducting federal and state taxes) was $1,474,000,000; and the net drink bill in 1930 (deducting federal and state fines, seizures



Except for the collar on every bottle, it might be a catsup filling department. Indeed, much of the best bottle filling and handling equipmen of today in other food manufacturing plants is borrowed or adapted from the beverage industry.

and taxes) was over $1,700,000,000. *On a per capita basis, the amount of money actually going to the liquor industry and its sources of raw materials was approximately the same, about $14 per year, although prices, conditions of sale, consumption, and practically every other factor were then totally different.*

On the basis of individual expenditure, then, repeal of the Eighteenth Amendment ought not to increase competition from an economic standpoint for industries now legal. People will not be spending any more money for liquor following repeal than they are spending today. No other interpretation of the figures is possible.

Although expenditures going to the liquor industry should not be expected to increase, volume of consumption of alcoholic beverages must do so if there is to be any definite industrial gain in repeal or modification. Those favoring prohibition have pointed this out to refute statements that prohibition repeal will encourage temperance. But a gain in liquid volume does not necessarily mean an increase in the consumption of alcohol, for comparison of present and past consumption indicates that the intra-industry competition under prohibition has favored distilled spirits at the expense of beer, and raised the average alcoholic content of the total volume consumed.

For the food manufacturer, however, increased volume of consumption brings up the problem of dietary competition, particularly for those foods and food accessories high in liquid volume. And the more federal or state regulations favor the alcoholic beverages of low alcoholic content, the more this factor will be accentuated. It is quite obvious, for example, that beer is a competitor of ginger ale, but that gin is the opposite.

The dietary effect of alcoholic beverages is not entirely a competitive one. Sale of those foods which are associated in the diet with increased consumption of beer may logically be expected to increase. "In a general way, consumption of biscuit products increases with the consumption of beverages of all kinds," an individual prominent in that field has stated. One of the hotel associations has taken the stand that repeal would be an advantage because the use of alcohol stimulates the consumption of food.

The competition of alcoholic beverages, legal or illegal, with the food industries is made more difficult to analyze by the fact that, by almost any logical definition, their manufacture is a part of the food industries. The brewing industry certainly falls into this class. Its raw materials are foodstuffs; its product has food value; and its processes of manufacture are similar where they are not identical. A decrease in the sale of hop-flavored malt syrups with the legalization of beer, for instance, cannot be considered a loss to the food industries when the net result is merely to carry the processing farther toward the ultimate product.

As a matter of fact, the brewing industry was a leader in the adoption of technical control for the manufacture of products for human consumption, and many of the ideas which originated there were later put into practice throughout the food field. The history of industrial bacteriology centers around the manufacture of beer and wine.

There is no point in denying, on the other hand, that serious consequences for the food industries as we know them today would result if the consumption of a number of other products, with the return of legal beer, went back to pre-prohibition levels of per capita consumption. L. J. Tabor, master of the National Grange, pointed out to the Senate subcommittee at the Bingham Bill hearings that consumption of milk products rose from 754.8 lb. per capita (milk equivalent basis) in 1917 to 997.5 lb. per capita in 1929.[9] To produce such an increase, he testified, required more than three times the 3,924,885,000 lb. of grain used in the manufacture of all the beer produced in 1917. If, for each 6 gal. of legal beer consumed, there is lost the sale of 1 gal. of milk, agriculture will lose by the shift.

Among those concerned in milk production and distribution there is no unanimity as to how seriously this threat should be considered. "In our opinion," one individual of high standing in the dairy industry has said, "the factors contributing most to increased consumption of milk have been the educational campaigns which have enlightened consumers as to the food value and sanitary aspects of dairy production, and to advertising. We are of the opinion that the repeal of the Volstead Act would in no way endanger the favorable position now held by the dairy products industries." It has been pointed out, too, that consumption of dairy products varies with national and racial groups,[10] and there seems to be no relation between these variations and the consumption of alcoholic beverages in these groups. Records of the Department of Agriculture[11] show that three non-prohibition countries, Norway, Sweden and Switzerland, have a higher per capita consumption of milk than the United States. Certainly, there have been many shifts in food consumption equal in importance to the one mentioned by Mr. Tabor which cannot be ascribed to prohibition even by the most far-fetched reasoning.

The carbonated beverage industry has also expanded rapidly in the prohibition period. To what extent will legal alcoholic beverages, particularly beer and wine, replace this increase in liquid volume? It has been rather generally admitted that carbonated beverages, combined with distilled spirits, have gone a considerable way in replacing the some ten-gallons-per-capita decrease in beer consumption that most of the estimates show. A leader in the beverage industry has written that "there is no question but that the prevalence in America of 'kitchen' gin has augmented the sale of ginger ale." Ad-

vertisements for a carbonated lime drink have illustrated what is unmistakably a gin-bottle stopper beside an iced highball glass.

The effect of prohibition repeal will depend upon the method of regulation through its effect upon the intra-liquor-industry competition. If regulations governing beer and light wines are considerably more liberal than those governing distilled spirits, it is highly probable that a considerable shift away from "mixers" will take place. Many carbonated beverage manufacturers, however, are in a position to gain more than they might lose by liberal regulations for the sale of beer, provided the requirements call for its sale in bottles. Certainly none of those now manufacturing cereal beverages of the "near" variety will object to the possibility of a higher alcoholic content. Several manufacturers in this field have frankly despaired of present conditions, and consumption of such products has shown a continual decrease from year to year.

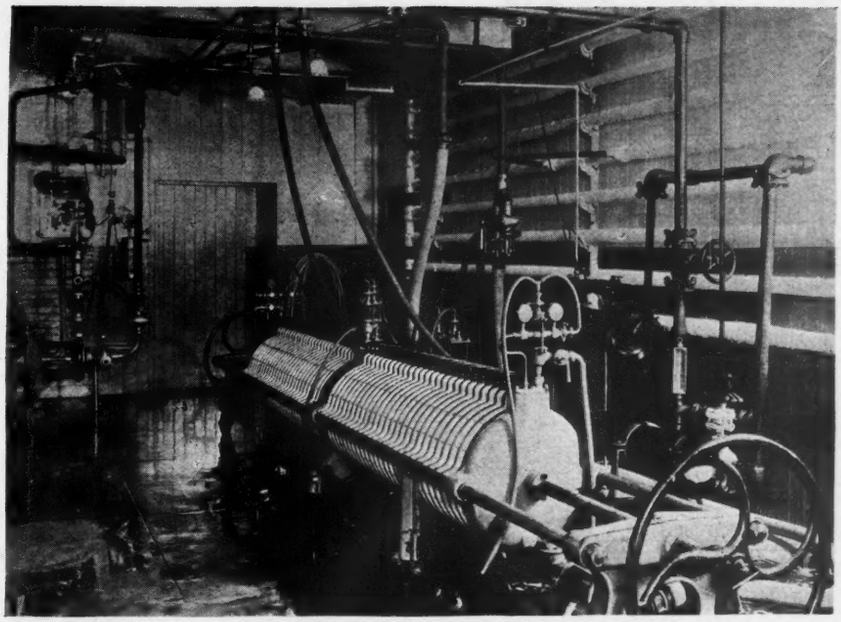
Finally, for carbonated beverages outside the "mixer" class, there is evidence to indicate that little if any change in consumption would occur. Robert Woodruff, president of the Coca Cola Co., has been quoted[12] as saying that sales of Coca Cola in 78 different countries bear no relation to beer or liquor production. When liquor laws in the Province of Ontario, Canada, were liberalized, Coca Cola sales continued to increase.

With the possible exception of certain "true fruit" carbonated beverages, any shift to malt and vinous beverages for the same per capita liquid volume would involve a net gain for domestic agriculture.

The threat of competition between candy and alcoholic beverages has appeared remote to those observers who have dissociated the question from the unjustified assumption that upon repeal there would be more money going to the liquor industry than is going there today. We have heard much of the workingman who went home with a box of candy on Saturday night in place of a pail of beer. A more logical assumption is that in the prosperous years of the recent past, he went home with both the box of candy *and* the raw materials for a batch of home brew. Today he probably is remaining home all week with neither.

The point has been raised that increased consumption of such alcoholic beverages as beer adds to the total calories in the diet, and that a corresponding decrease ought to be expected somewhere else. But the caloric value of the average diet has not been constant. It has been lowered, for instance, by dietetic shifts from cereal products to vegetables and fruits of lower food value per unit weight. It has been pointed out[13] that the average energy intake per American per day is now some 800 calories higher than the average fuel requirement, so that reasoning made from an energy basis, rather than from an appetite basis, has little validity. From the latter standpoint, the stimulating effect of alcoholic beverages upon the appetite and gastric digestion has been recognized by medical opinion.[14] It appears, then, that any possible effect of increased consumption of alcoholic beverages from a dietetic standpoint upon the canning industry, the meat-packing industry and other major fields of food manufacture would be stimulating, rather than competitive.

If the Eighteenth Amendment should be repealed and control of the liquor problem returned to the states, the effect on the food industries, it seems clear, would be advantageous. No more money would go to the liquor industry than goes there today, and a greater portion of this money would be passed on to producers of raw materials, manufacturers of equipment and accessories, and to workers in the industry—money that now goes to the tin boxes of politicians, the coffers of bootleg kings and others who are not thereby made better customers of the food industries.



The pulp filter for filtering finished beer, shown here in its native habitat, is used also in juice filtration and gelatin manufacture. Note also other familiar items: centrifugal pumps, heat exchangers, refrigerating coils, sanitary fittings, hose, and automatic temperature control.

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Moisture Content of Bread

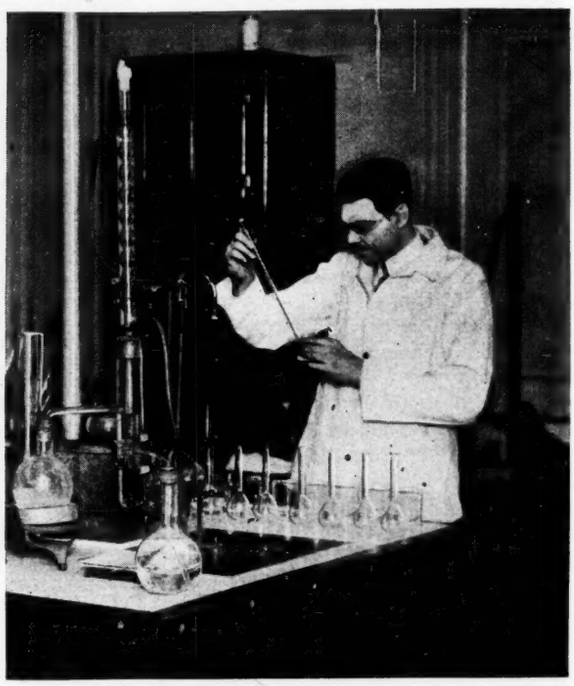
In the article by William L. Owen entitled "Ultra-Violet Ray Prevents Molding of Bread," appearing on page 208 of June, 1932, FOOD INDUSTRIES, the author explains that "normal bread with its 45 to 58 per cent of moisture," has reference to the original water content of the dough batch and suggests that the statement "bread with the 45 per cent original water used in its preparation" be substituted. The present U. S. standards for finished bread allow a maximum of 38 per cent moisture.

Vegetable Parchment; Not Waxed Paper

Vegetable parchment—not wax paper—is exclusively used by the Atlantic Commission Co. to wrap the butts of celery hearts washed and packed in its plant at Jersey City, N. J. The operations of this plant were the basis of the article entitled "Adding Consumer Appeal to Fresh Goods," on page 212, June, 1932, FOOD INDUSTRIES.

Control Chemist or White-Coated Window Dressing?

By THE MAN IN THE WHITE COAT



To some manufacturers a chemist is merely a luxury to have about the plant to impress customers. With such technical window dressing we have not a particle of sympathy; instead we sympathize with the man who knows he is a control chemist in name only and is employed by one who is incapable of profitable use of the services of a food engineer. To chemists in such a situation we suggest that they make the best of their present jobs, but get new bosses at the earliest opportunity. To those bosses who haven't learned how to make proper use of a chemist, we suggest that they take an inventory of themselves—*The Editors.*

THIS question of technical control vs. technical window dressing is confronting many chemists who are so unfortunate as to be associated with manufacturers not exactly ethical in their business practices. The seriousness of the situation calls forth a feeling of genuine sympathy for the chemist so placed. He knows that his reputation and professional standing are based on experience and accomplishments and, as he sees himself rapidly relegated to the rôle of a "yes man" or a "rubber-stamp chemist," he realizes that his reputation will profit but very little by the experience he is gaining. Inasmuch as he senses that the only value placed on his services is the extent to which he can be used as "window dressing," it is not surprising that he becomes thoroughly disgusted and discouraged, not only with the manufacturer with whom he is associated but with the industry as a whole.

My advice to a chemist so unfortunately situated is to break away. The unprincipled manufacturer has little or no standing in his industry and association with him is a very poor recommendation for a chemist to offer when seeking a new berth.

There are plenty of opportunities for a chemist in the food industry. Also there are many reputable food manufacturers who place a true value on the services of the chemist in the industry and offer ample opportunities to the food chemist for advancement in his chosen profession. In fact, in a relatively short period of time the growth and development of the manufacture of foods has advanced at such a rapid rate that today it is one of the leading industries in the world.

The greatest factor in this development has been the food chemist or food engineer. Scientific minds have given to the food manufacturer efficient, labor-saving machinery, and equipment for packing, canning and bottling of foods that enable him to turn out his products in quantities not previously thought possible. Specific methods of processing and sterilizing have been developed to protect the manufacturer against spoilage of his products. The control chemist, by analysis of all raw materials, by rigid supervision of every phase of manufacture, and by close inspection and examination of all finished products, assures the manufacturer that the moral obligation he has assumed, to produce wholesome and healthful articles of food, has been fulfilled.

The successful food manufacturer, whose products have gained a world-wide reputation for quality and purity, has attained this enviable position by recognition of the indispensable character of the food engineer in the manufacture of his products. His confidence and faith in the ability of the food chemist is well demonstrated by the many chemists of high repute who are today dominating factors in the food industry.

It is the manufacturer of questionable reputation who never has given and who never will give to the chemist his rightful place in industry. He is the type of manufacturer who is either too ignorant of technical matters to appreciate the true value of the control chemist or who has unsound and unethical business principles, and egotistical ideas which have blinded him to the necessity for scientific control

in the manufacture of food products.

The "questionable" manufacturer is, in a certain sense, a shrewd business man. He sees a certain value attached to the presence of a chemist in his plant. And from a strictly commercial standpoint he visualizes the chemist as an effective advertising medium. Consequently, he retains a chemist and delegates to him so little authority that the chemist has little or no control over the quality of the products produced. The manufacturer then proceeds to broadcast far and wide the fact that every operation in the manufacture of his products is carried out under the strict supervision of expert food chemists. To his unethical mind this announcement is a pretty gesture and constitutes smart advertising. He gives little thought and consideration to the false light in which he has placed the chemist by using him as "white-coated window dressing."

Advertising—ethical advertising—is the backbone of any business. I do not deny the commercial value attached to the food chemist in this respect. By exploiting the control chemist and his laboratory the manufacturer can gain quite a bit of desirable and profitable publicity for his products. It is not unusual to see in magazines advertisements picturing the chemist in his laboratory performing one of his many duties. I have not the least criticism of this method of advertising if substantiated by facts and the existence of a bona fide control laboratory. It is an effective way of creating in the mind of the reader the thought of quality. But I do criticize, and justly so, the manufacturer who will, through the advertising medium of his chemist, create impressions which misrepresent the true conditions existing in the manufacture of his products.

Not more than a year ago there appeared in one of the current magazines the advertisement of a food manufacturer, depicting a chemist seated at a desk peering very intently through a microscope. Nicely arranged in front of him on the desk were bottles and cans representing the products of this manufacturer. The descriptive matter accompanying the picture was cleverly worded in a manner to give to the reader the impression that every product of this manufacturer was produced under the closest supervision of a food chemist. There was only one thing in connection with this advertisement that could be admired and that was the courage and the daring of the manufacturer in having it published. The "chemist" was none other than the production manager and the microscope had been borrowed from a local hospital. That, in my opinion, was carrying "white-coated window dressing" to the *n*th degree.

It is to be regretted that there are some chemists who will permit their names and pictures to be used in fictitious advertising, but I am safe in stating that they are very much in the minority. The reputable food chemist does not need this sort of publicity; he does not seek it. Instead he strongly resents it. The manufacturer who persists in using his chemist as a publicity stunt for the company's benefit is most decidedly unfair and unjust to the chemist. If he does know the seriousness of his offense he does not care how much damage is done to the professional standing of the chemist by subjecting him to such unethical practices.

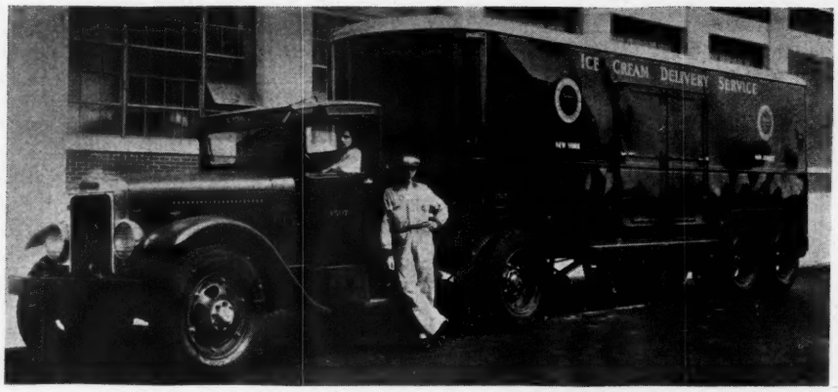
There are no mysteries connected with the success of the large food manufacturers. They have adopted sound business policies and principles and have adhered to them. Furthermore, they have built up their reputations by setting high standards of quality for their products, never permitting quality to become subservient to quantity. However, there is a mystery, and a puzzling one, connected with the "questionable" manufacturer. One is at a loss to understand just why he does not take a leaf out of the notebook of the successful manufacturer and adopt similar policies which have already proved dependable. It is not because he is ignorant of the correct methods of manufacture; he is shrewd enough to keep abreast of the latest developments in his industry. This type of manufacturer is invariably a "quantity producer." His pet policy is quantity production, and he will permit nothing to upset that policy. To feed his ego, he will retain a chemist and place on the shoulders of the chemist the full responsibility of quality. Oh, yes, he wants quality! He is loud in his demand for quality, but the chemist must be sure not to put into effect any plans or operations to maintain or improve quality that will in any way interfere with quantity production.

To illustrate, I cite the case of a manufacturer located in one of the eastern states, who, finding it necessary to make a change of chemists, instructed the new chemist, upon his arrival, to make a complete survey of the plant and report just how and where the products could be improved. This the chemist did, and turned in a detailed report which contained quite a number of practical and constructive suggestions. Much to the chemist's surprise practically none of his suggestions was put into effect. When the matter was taken up with the manufacturer the chemist was told that his report had brought out some very good points, but that to carry out these points would have a tendency to slow up production, which, of course, could not be permitted. The manufacturer had a "quantity" mind, and nothing could switch him to quality consciousness.

All manufacturers of food products should have a thorough knowledge of the provisions of the federal and state food laws and the standards of quality specified by these enactments. I believe a large percentage of the manufacturers are well informed regarding the regulations of the Federal Food Law, have a wholesome respect for it, and spare no efforts to meet every requirement set forth in these standards. The successful manufacturer fully appreciates the stabilizing influence this law has exerted in the manufacture of foods and he gives hearty cooperation to the food authorities in the enforcement of their regulations. But not so with the "questionable" manufacturer. He will violate without compunction any regulation which interferes in the least with the carrying out of his own policies. He demonstrates very clearly that he is not sincere in his desire to comply with food regulations or the specifications of his customers, not only by the manner in which he ignores suggestions and advice of his chemist in matters pertaining to the quality of his products but also by giving to the chemist so little authority that he is powerless to prevent the manufacture of foods which are below the standards specified by law or by his contractual obligations.

It is the duty of the control chemist to protect the manufacturer in such matters, and he is quite competent to do so if he is given the opportunity. But he is not always given this chance. Against the advice of the chemist the manufacturer may use raw materials of an inferior grade, from which it is impossible to produce goods which will comply with the Federal Food Law regulations or the customer's specifications. Even after a warning from the chemist that the products are below standard, the manufacturer in some cases deliberately orders the products shipped out, with the hope that they will "get by." Then, when he finds his product in the toils of Federal Food Law or, as is more often the case, he is questioned by his customers, he hides behind the "skirts" of his chemist, utterly "amazed" that his products were not of the highest quality. Where does he place the blame? On the chemist, of course; was not the chemist responsible for quality?

What can a conscientious chemist do for a manufacturer like that? I do not want to create the impression that the control chemist is a glutton for authority. He is not. Instead he is a decidely human individual, and a conscientious one, at that. Quite naturally, he knows that when a responsibility has been placed on him he has a right to demand sufficient authority to permit the proper performance of his duties. I can see nothing unreasonable or unfair in such demands, yet there are some manufacturers who evidently consider them as such, if one may judge from the restrictions placed on the chemist.



One of two 6,000-gal. tractor-trailer jobs that carry ice cream from Borden's plants to its distributing centers

What Five Million Miles a Year Teaches About Cooling Trucks

By FRANK K. LAWLER
Editorial Department
Food Industries

DELIVERY COSTS afford the average ice cream manufacturer a good opportunity to effect a much-desired curtailment in costs. And refrigeration of rolling stock represents a "branch" of expenditure quite likely to need "pruning." Realizing this, the ice cream division of the Borden Co. and associated companies in New York City has experimented with different refrigerants and refrigerating equipment. More important, it has reached some definite conclusions. Since this company delivers millions of gallons of ice cream annually over more than five million miles, to serve what is probably the world's largest market for the product, its experience in refrigerated transportation is significant.

Except in four mechanically refrigerated trucks, the ancient and honorable —but, nevertheless messy, bulky and heavy—refrigerant, ice and salt, cooled Borden's ice cream until 1928. At that time, solid CO_2 was making its début, and it showed such promise that E. J. Lockwood, of the Borden Co., developed a body to utilize the "dry ice." Lockwood's design incorporated the gas-circulation type of refrigeration, in which the sublimed solid CO_2 is circulated by gravity between the walls of a double tank forming the ice cream compartment (see Fig. 1). An objectionable feature of this body is the projection of the "dry ice" compartment into the ice cream compartment, usurping space that should accommodate ice cream.

Despite this, the new solid-CO_2-refrigerated bodies considerably increased the pay load of the trucks over those equipped with mechanical units, being from 600 to 800 lb. lighter than the latter. But in this early stage of experimentation, superiority of carbon dioxide ice could not be accepted, and, in 1930, the Borden Co. put ten more mechanical jobs on its ice cream routes. To date, its eleven trucks equipped with this type of cooling are all giving satisfactory performance. All Borden's mechanical units receive power from the drive shaft, and they are operated on outlying, long-haul routes.

Last summer, solid CO_2 cooling for rolling stock received an important boost in the form of a new type of body. This development involves refrigeration by conduction and employs a single tank over the top of which extends a metal plate, or conductor (see Fig. 2). Heat in the ice cream compartment travels to the refrigerant via the metal plate. The conduction system of solid CO_2 refrigeration not only eliminated the tank-within-a-tank arrangement of the Lockwood body, with its extra weight and higher first cost, but it increased the capacity of the ice cream compartment by doing away with the projecting solid CO_2 container. With it, the carbon dioxide ice rests on the metal plate and is completely outside the refrigerated compartment.

And the advantages of the conductor type of body did not stop there. In operation, it proved immensely more efficient than its predecessor. For example, a 600-gal. body used in Newark, N. J., last year consumed, on the average, 28.9 lb. of refrigerant daily during August, while a Lockwood body of the same capacity used 50 to 55 lb. This high efficiency resulted in part from temperature control obtained by inserting thin resistance pads of corrugated paper between the solid CO_2 and the conducting plate.

Lower and more uniform temperatures represent other advantages of the conductor body over the gas-circulation type. As low as —40 deg. F. may be reached with the former, the average range for its temperature being from —10 to —15 deg. F. Zero to +10 deg. F. is the usual temperature range for the Lockwood body. Maintenance of more uniform temperature with conduction refrigeration results from sublimation of the dry ice from only the one side which is in contact with the conductor. This causes the horizontal cross-section of the cube—the area effective in absorbing heat—to remain approximately the same. In the case of the Lockwood body, sublimation takes place on all sides, and the exposed area of the cube gradually diminishes from maximum to zero.

The Borden Co. sees many advantages in solid CO_2 refrigeration for trucks as compared to mechanical cooling, especially with the conduction type of body. Consequently, it has definitely decided

to use it altogether in the future. Aside from the weight factor, the company objects to mechanical refrigeration because of high first cost, because of the necessity for employing service men to condition the units, and because a breakdown on the road may cut off refrigeration and permit the load to spoil.

The company, of course, favors the conduction system of solid CO_2 refrigeration. However, the new controlled-temperature solid CO_2 unit which utilizes a secondary refrigerant, the flow of which is regulated by a thermostatically operated valve, is to be given a test in the near future.

The Borden Co. already has the distinction of being the world's largest consumer of solid CO_2, using about 12,000,000 lb. annually. Contributing to this consumption are 297 trucks, all but twelve of which are of the Lockwood type, put into operation between 1928 and 1931. The other twelve are conduction bodies that went onto the routes last year.

Conduction body provides more space for pay-load than gas-circulation type

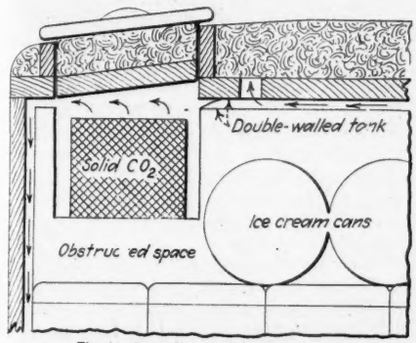


Fig. 1 - Gas-Circulation Body

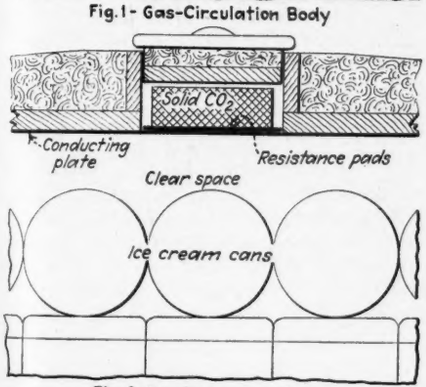


Fig. 2-Conduction Body

Despite their enthusiasm for solid CO_2, Borden officials have their troubles with it, as do all its users. Chief among the problems are control of temperature and reduction of shrinkage in handling. Another factor which proves harassing, but over which there appears to be no control, is variation in the rate of sublimation of the "ice"—and in its rate of consumption—which vary with the relative humidity of the air. Temperature control is being mastered as experience is gained in the use of resistance pads, and shrinkage is being kept to a minimum by education of employees to make speed and take care in handling the refrigerant.

In carrying the ice cream from plants to distributing centers, larger trucks are employed than operate on the delivery routes. Two of these—the pride of the Borden fleet—are gigantic tractor-trailer jobs with a capacity of 6,000 gal. of ice cream. Four others have a capacity of half that amount. Other trucks of the ice cream fleet range in capacity from 75 gal., of which there are only three or four, to the regular 800-gal. route trucks. The route trucks have three refrigerated compartments with access at the side and a fourth compartment at the rear for empty cans. Hatches on the roof open into the solid CO_2 compartments.

The army of Borden trucks roll out of their garages in the morning all tuned up for the day's run, and call at the distributing centers. Ten minutes before receiving cargoes, the vehicles are "iced" to allow time for the bodies to cool. Then they are loaded according to a routing schedule made out the previous night by the call system of distribution, in which the order for each dealer is obtained by telephone. No extra ice cream is carried and only enough "ice" goes into the trucks to keep them cool until the last delivery is made. That is real efficiency.

At the 141st St. plant of the company, the largest and most modern ice cream plant in the world, the cans and packages travel from the hardening room to the loading platform on link- and belt-type conveyors, respectively. These conveyors are electrically operated, pushbutton-controlled units that project through the hardening-room wall adjacent to the loading platform. Swinging doors permit ice cream to pass through the wall, and these swing shut immediately to keep out warm air. Heavy sliding doors close the openings when the conveyors are idle.

Borden's most recent step toward minimum delivery costs takes the form of portable belt-type electric conveyors which transfer goods from the delivery end of the hardening-room conveyors to trucks at the other side of the loading platform, an operation formerly done with hand trucks. An unusual feature of the portable conveyors is an extension which telescopes the conveyor proper and allows clear space at the edge of the platform when the units are not being used.

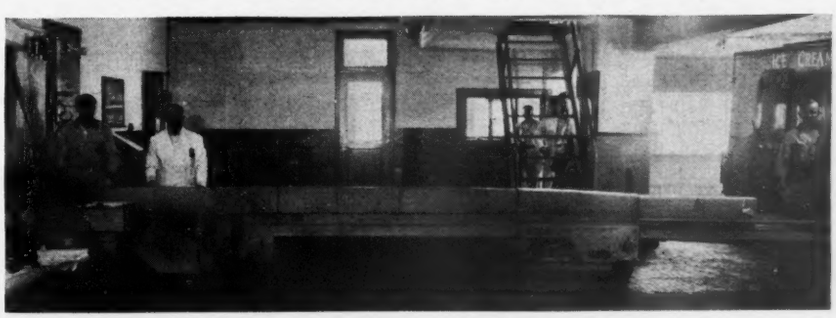
Solid CO_2 for Borden's trucks is delivered to distributing centers twice daily. It comes in snow-white cubes, 10 in. on a side and weighing from 50 to 55 lb. The cubes are put into the trucks by hand, a band saw on the loading platform being used to cut them into sections of the size required to carry the load of the vehicle. For protection, employees handling the dry ice wear leather-palmed canvas gloves inside of which are cotton gloves. Although the refrigerant has a temperature of —109.6 deg. F., burns are seldom received from it.

Anyone worried as to whether the CO_2 supply will last on long hauls may be put at ease by apprisal that trucks may stay out fifteen to eighteen hours. Borden's average run requires eight hours. During this period, in the summer, the doors are opened on an average of 100 to 110 times, the driver making that number of stops. In winter the average is 85 stops.

An idea of the quantity of solid CO_2 consumed by trucks may be gained from the fact that on a hot July day when the humidity is fairly high, a 375-gal. conduction body requires, on the average, 45 lb. of refrigerant. This is with a headening-room temperature of —20 deg. F.

In summarizing the manner in which the Borden Co. has worked out its refrigerated transportation problem, it may be said that the company is definitely committed to the use of solid CO_2, that it has found the conduction type of body most efficient, and that it determines how much ice cream to carry on each truck each day, and carries that much and no more. These are the main cogs in the machine by which the company trims truck refrigeration costs to the bone to keep a satisfactory margin between cost and selling price. Many other companies whose operations are of a lesser magnitude can undoubtedly trim distribution costs by proper attention to refrigerated transportation.

At Borden's 141st St. plant, ice cream travels from hardening room (left) to truck via new portable, electric, belt-type conveyor



Manufacturers' Spot Stocks—

Misuse of Common Sense In Distribution

By JOHN H. FREDERICK
Assistant Professor of Commerce and Transportation
University of Pennsylvania

DURING recent years many manufacturers of food products have adopted the policy of maintaining local or spot stocks of their merchandise in public warehouses at strategically located points. A spot stock is a carload or more of goods which are shipped from the factory and stored as the manufacturer's property at a center where he feels the goods will be needed to supply consumer demand. The spot stock is, therefore, a distinct stock of goods set aside for a definite market and is by no means the same thing as a surplus stock at the factory.

Manufacturers have adopted this policy for several reasons, but chiefly to meet the demand for service on the part of certain types of wholesalers and distributors. Retailers have been shifting the carrying of stocks back to the middlemen, and they, in turn, wish to pass the burden back to the manufacturer whenever possible. Someone, however, must be responsible for getting the goods within easy reach of the retailer; for carrying the financial burden; and for undergoing the necessary risk. Manufactured goods that are nationally advertised must be nationally distributed, and many manufacturers feel that it is a physical impossibility to render the service demanded by the trade today without supplying that trade from some near-by public warehouse.

The policy of placing spot stocks in public warehouses was forced on the manufacturers, in a measure, when the regularly established wholesalers in numerous trades, of which the grocery trade is an outstanding example, adopted the more or less uniform plan of hand-to-mouth buying and developed a resistance to buying in carload lots. Coupled with this was the tremendous difference in transportation costs between the carload rate and the less-than-carload rate, so that the manufacturer really had no choice except to carry stocks as close to the wholesaler as possible. In order to take care of the wholesalers' small orders, manufacturers are forced to ship in carload lots to a near-by central point and fill orders accordingly.

Under distribution conditions as they exist today leading manufacturers in the food trades, as well as in other similar trades, recognize that:

1. Through systematic and organized effort, goods must be placed at their approximate destination before the sale is made to the retailer.

2. Retailers must always have goods on hand in order to prevent loss of consumer trade through substitution. This means that wholesalers must be supplied when they want the goods.

3. When there is a heavy advertising expenditure on the part of manufacturers, goods must be kept constantly in the wholesalers' and retailers' stocks or a considerable part of such expenditure will be wasted. Some manufacturers frankly say that, from their standpoint, they wish they could discontinue the carrying of spot stocks in public warehouses and that were it not for the pressure of competition they would endeavor to force the wholesaler to buy either in pool cars with others in his city or vicinity, or in sufficiently large quantities at one time to justify carload shipments.

The chief service of the wholesale grocer in marketing manufactured goods is to supply the retailer with merchandise. He purchases goods in large quantities and in many verieties from manufacturers, importers, and other wholesalers; these he then divides and sells in smaller lots to retailers. Thus, his most important function is to act as an agent of dispersion for the manufacturer and as an assembling agent for the retailer. Among his other services to retailers are the extension of credit and the affording of aid in merchandising. For the manufacturer, the wholesaler provides an intensive coverage of the trading area in which he operates; he buys outright, assumes the risks incidental to granting credit, storage and selling.

Considering the services which wholesale grocers render to food-products manufacturers, it seems almost inconceivable that such manufacturers have antagonized some of their best customers by fostering a policy of rendering service through spot stocks in public warehouses. This, however, appears to be the case.

During the past two years the writer has published articles pointing out the uses which manufacturers can make of public merchandise warehouses as a part of their scheme of distribution. The assumption was that carrying of spot stocks by manufacturers was desired by the wholesalers. That this was not always the case was made evident from the following letter received from a prominent wholesale grocer:

> It is my opinion that the carrying of local or spot stocks in public warehouses by manufacturers creates conditions that in the main are unfavorable. Such stocks permit of small-order deliveries to small wholesalers, some of whom are not actually wholesalers at all, as well as firms of very weak financial standing. A good deal of the serious price competition now prevailing originates with this class of merchants or firms.
>
> It is my judgment that the position of the wholesalers at large, meaning to include in this classification wholesalers of substance, would be very greatly improved if all such stocks were withdrawn. In a sense they are of some convenience, therefore of some value to most wholesalers, but they harm to a much larger degree than they help. It is my judgment that the wholesale business would be resting on a much firmer foundation if supplies could only be obtained in substantial quantities; said quantities, of course, varying in accordance with the nature of the article.
>
> When consideration is given to the cost of storage and handling—costs that do not apply to direct shipments from manufacturers—it is doubtful that spot stocks are of advantage to the manufacturer.

To ascertain the sentiments of the wholesale grocery trade on the question of manufacturers' spot stocks, letters were sent to 125 of the leading wholesale grocers in all parts of the country, as evidenced by their membership in national or state wholesale grocers' associations or in their representation at the recent Trade Practice Conference on the grocery industry. These men were asked the following:

1. Is the food products manufacturer's practice of carrying spot stocks in local public warehouses regarded as undesirable competition by wholesalers or is it regarded as advantageous in that they thus can carry smaller stocks themselves?

2. Does the practice reduce the fundamental functions of the wholesaler in an undesirable fashion?

3. Does the practice increase competition and promote price merchandising by fostering the growth of small whole-

salers who must have quick turnover and whose limited credit forces them to buy in small quantities?

Fifty wholesale grocers replied to these questions. Of these, 42, or 84 per cent, definitely regarded the carrying of spot stocks by manufacturers as undesirable competition, felt that it reduced the fundamental functions of the wholesaler in an undesirable fashion, and believed that the practice increased competition through fostering the growth of small wholesalers or so-called "desk jobbers." One or two wholesalers qualified their replies by stating that whether spot stocks were objectionable or not depended on who was allowed to draw from them. If spot stocks were carried for direct delivery to the retail trade, for example, they would obviously be detrimental to the wholesaler's interests.

Only eight of those replying, or 16 per cent, stated that they were in favor of manufacturers carrying spot stocks in public warehouses. This in spite of the fact that manufacturers feel that this is a service *demanded* by wholesalers!

Excerpts from some of the replies make clear the wholesaler's objection to manufacturer's spot stocks:

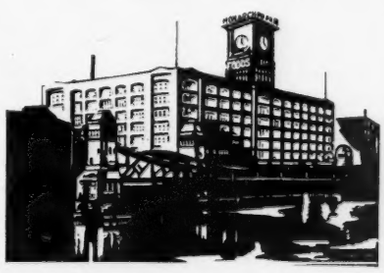
"1. It is my opinion that stock carried by manufacturers in public warehouses is a menace. It has many bad features. Take for instance a firm like ours, which carries a large stock. We buy in carload quantities. Some competitor of ours does not buy in carload quantities for some reason, but he is able to make a purchase just as cheap as we buy a carload. Now if there were no merchandise available in the warehouse this same man would make his purchase from the carload buyer at a very small additional charge, which we should be entitled to. Instead of that he buys a single case at the same price that we would buy a carload. Naturally his cost of doing business is much cheaper. Just such merchants as this many times do not put the proper amount of profit on their sales and cause price cutting, and no one ever benefits from a price-cutting campaign."

"2. I am of the firm conviction that a wholesaler might just as well consider closing up shop when he finds himself up against the problem of the manufacturer who carries spot stocks, because, human nature being what it is, there is the natural tendency to sell all comers, regardless of whether they are wholesalers, retailers, or any sort of buying agency."

"3. Carrying spot stocks in public warehouses by the packer or the manufacturer is very undesirable competition for the wholesaler. I believe today if manufacturers were not carrying on this expensive method of distribution, the wholesalers could buy at a lower price than they are, and pass this saving on to the consumer. But, as it is, the wholesaler in the course of his development has all the facilities for buying direct from the manufacturer, warehousing the goods, and paying for them in ten days. So when the manufacturer starts carrying spot stocks in order to get the business, as I see it, from unreliable or financially light retailers and wholesalers, somebody is having to pay this excessive distribution charge. It does not help the wholesaler in any way to carry smaller stocks, because he has to have the variety, and the manufacturer does not carry this variety, as a rule, in his spot stocks."

It would appear that the growing tendency for manufacturers to store their products as spot stocks in public warehouses is destroying the natural function of the wholesale grocer to a considerable degree. It is a natural function for the wholesale grocer to operate a warehouse for the general distribution of the products of a great number of manufacturers and to see that their products are distributed to retail merchants located in every city, town and rural district within a radius of economical distribution, in quantities suitable to the requirements of every one of those dealers, from the very largest to the very smallest crossroads general store. Because of the great diversity of lines handled, the wholesale distributor of this type is able to operate at a minimum cost. Promiscuous storing of stocks in public warehouses by manufacturers is rapidly destroying this function of the wholesale food distributor, who as a result is in competition with manufacturers' representatives, brokers and "desk jobbers," who take the cream in the form of business from the larger outlets, leaving the skimmed milk, from which the wholesaler must extract his profit. Continuance or extension of this practice may eventually result in elimination of the service wholesaler, and it will naturally follow that the smaller retail dealers will not survive without the delivery service and credit accommodation now given by the wholesale grocer only.

It is a question whether the carrying of spot stocks is as profitable for the manufacturer as it once was. Unquestionably it has increased his cost of distribution, although at one time it gave him an advantage over his competitor who did not have spot stocks, thus increasing his business and perhaps offsetting the warehouse charges. As time has gone on, however, it has become the general practice among food-products manufacturers to carry such stocks, and there has been less profit to everybody because prices have not been raised correspondingly. Many instances might be cited where the same prices exist on spot stocks as existed previously on shipments from the factory, making allowances, of course, for recent price declines. It has also had a marked effect on the quantities purchased; wholesalers as well as chains and other big buyers know the goods are readily available and so tend to buy in smaller and smaller lots. This tendency increases the cost of doing business to a large extent, as the same selling effort and clerical work are required as for a much larger order.



The carrying of spot stocks by manufacturers undoubtedly has put the smaller wholesaler in a better position to compete with the large. The desire of the brokers or salesmen in charge of these stocks to stimulate sales leads sometimes to the establishment of small concerns with little or no capital and limited facilities, who make cut-throat prices on those commodities they are able to buy from day to day in small quantities. Usually, such concerns operate with practically no overhead, are more or less ephemeral and nearly always constitute a demoralizing influence in the trade.

The objections of wholesale grocers and the troubles arising from the carrying of spot stocks by manufacturers might be partly eliminated by setting a reasonably large minimum limit on orders obtainable from such stocks. It seems only fair that a man buying from the warehouse stock should be obliged to pay a premium in accordance with the cost of warehousing and handling. Moreover, some distinction must be made as to who would be privileged to draw from such spot stocks, in order to prevent two or three small buyers clubbing together to get the minimum quantity even though it were set at a fairly high figure.

Control of the situation is in the hands of the manufacturer, who has the legal right to select his distributors. It is his problem whether he wishes to stick to the legitimate wholesale grocers who discount their bills every ten days or to seek other outlets. That the matter is receiving the serious consideration of numerous food-products manufacturers is evidenced by statements recently made to the writer, of which the following is typical:

The last two or three years we have been obliged, due to the hand-to-mouth buying policy of the average wholesale grocer, to carry warehouse stocks at several points. It is an evil that probably will be corrected as conditions improve and as more manufacturers acquire the intestinal stamina to refuse to carry such stock for the convenience of the trade. In the meanwhile, we, as other manufacturers, feel we must protect our consumer demand by not permitting jobbers and retailers to let their stocks be without our merchandise.

Certainly, the attitude of the larger wholesale grocers toward the carrying of spot stocks should be considered by all food-products manufacturers in connection with their distribution policies.

Man-Hour Accurate Yardstick For Plant Efficiency

In these unusual times, plant operators find themselves in a dilemma when it comes to determining whether their efficiency is on the road to improvement or is bound for other parts. The comparison of different departments, plants and periods of operation is rendered difficult by decreasing prices, wage cuts, shortening of working hours, and labor-gang reductions—to say nothing of changes in plant operating methods and equipment. The way out of this muddle via the man-hour ratio of production is indicated by Mr. Weart.

By S. A. WEART
New York, N. Y.

OF ALL the varying production factors entering into plant operation, none is as sensitive to change in operating volume and at the same time as unvarying as a standard of comparison for operating efficiencies as the man-hour. It stands out alone as a least common denominator of industrial operations which is universally applicable.

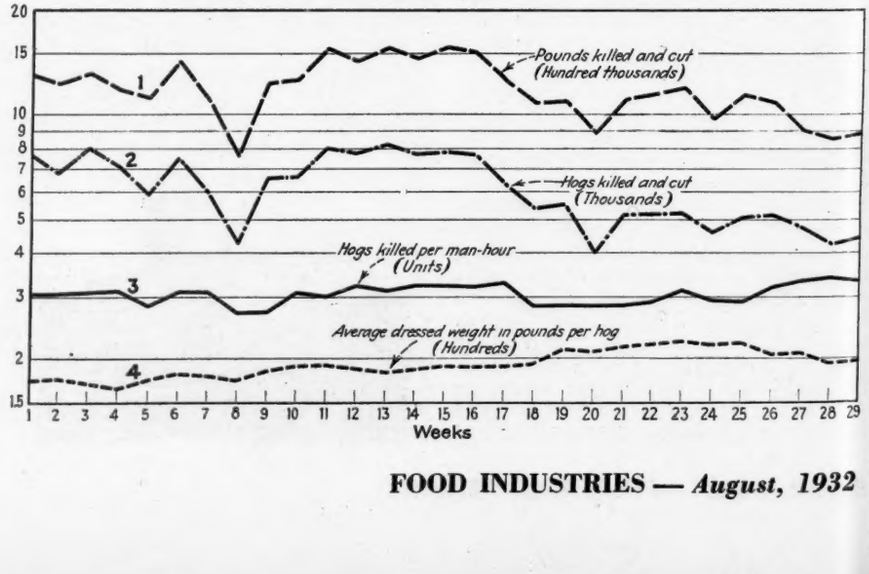
The worth of this unit as a "yardstick" for gaging the results produced by improvements in operating methods and equipment may be well shown by an example taken from the rapidly fluctuating pork-packing industry. The particular plant considered is located near the largest livestock yards in the country and engages in a general fresh-pork, dry-salt, sweet-pickle and smoked-products business. Operating conditions of the plant for a 29-week period are shown by curves 1, 2 and 4 in Fig. 1.

Pork-packing has a number of inherent features which make difficult the exact comparison of any one period of operation with any other period, except over long intervals of time. The principal variables tending to obscure the true meaning of results obtained by changes in methods or equipment are the uncontrollable and widely fluctuating weights per hog, number of hogs killed and changes in the manner of cutting.

In addition to the disturbing conditions normal to the packing industry, operating departments of the particular pork packer in question were subjected to other independently disturbing elements, of which the more important were a reduction in wage rates and a great variation in time of starting and stopping work. When into this mass of independently acting variables is placed still another group of factors—those whose effect upon the whole it is desired to find—it is apparent that even such an excellent least common denominator as the man-hour will be severely taxed. The new group of factors was composed of various improvements in methods and equipment, including such items as labor eliminations, changes in material-handling methods and variations of as much as 60 per cent in operating speed.

It was the effect of just these improvements in methods and equipment that it was desired to determine, at the same time making proper allowance for all other operating variables. Utilization of the man-hour appeared to offer the best solution. One of the advantages of the man-hour was at once noticeable: All of the factors necessary to determine accurately any changes in operating efficiency were already recorded as a matter of routine. Number of hogs killed and cut, and pounds handled were totaled daily and weekly in plant operating records. Man-hours were obtainable from timekeepers' reports with almost no clerical effort.

Fig. 1—Operating conditions of the pork-packing plant to which the man-hour efficiency yardstick is applied in this article, taken over a period of 29 weeks. Comparison of curves 2 and 3 shows constancy of man-hour as a standard of comparison as well as its sensitivity to wide variance in volume of operation



Simple arithmetical calculations reduced the apparently meaningless production figures to the basic ratios of pounds or hogs killed or cut per man-hour. A sample of the tabulations used for determining cutting efficiency is given in Table I—simplicity of the calculations is apparent.

From time to time during the 29 weeks considered, changes were made in methods of operation; certain employees were transferred to other jobs or eliminated entirely; various mechanical devices were installed to expedite material handling; line speed was changed from a rate of 360 hogs per hour to 250 and back again to 400 in attempts to find the most economical operating condition. In almost every case, and in every case of major change, results attained were reflected in the two basic ratios of pounds or hogs per man-hour.

because the difficulty of handling is increased. Considering this tendency as a factor of safety, a practical figure for the true net increase in efficiency may then be found by subtracting the percentage increase in "Average Weight Per Hog" from the percentage increase in "Pounds Cut (or Pounds Killed) Per Man-Hour." Table II compares operating efficiencies at the beginning and end of the 29-week period, averages being taken over five-week periods to minimize the effect of any unusual condition.

The various ratios are shown graphically in Fig. 2. The relatively slight increase in killing-gang efficiency is exactly what was expected, few changes in operating methods having been made in comparison to the number of improvements instituted in cutting-gang methods. The bottom curve also is shown

Table I—Tabulated and Calculated Data Employed in Obtaining Man-Hour Ratios

Given Data

Week	Total Hogs Cut	Total Pounds Cut (thousands)	Man-Hours
1	7,700	1,338	2,525
2	6,710	1,168	2,207
3	8,050	1,350	2,597
4	7,060	1,178	2,270
5	5,890	1,045	1,742

Calculated Data

Week	Average Weight per Hog	Hogs Cut per Man-Hour	Pounds Cut per Man-Hour
1	175	3.05	530
2	174	3.04	530
3	168	3.10	520
4	167	3.11	519
5	177	3.38	600

Table II—Man-Hour Comparison of Operating Efficiencies at Beginning and End of 29-Week Period

Period	Pounds Killed per Man-Hour	Pounds Cut per Man-Hour	Average Weight per Hog
Last five weeks...	651	735	204
First five weeks..	526	540	172
Increase.....	125	195	32
Percentage increase.....	23.8	36.1	18.6
Net per cent increase.....	5.2	17.5	....

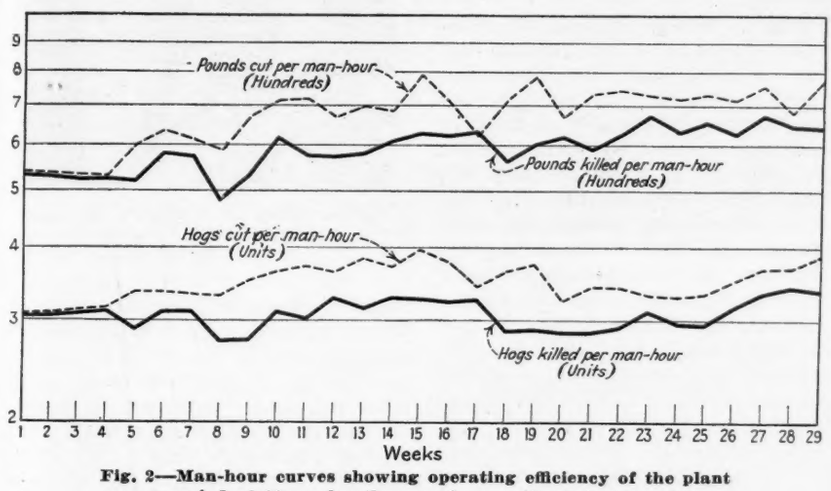

Pounds cut per man-hour (Hundreds)
Pounds killed per man-hour (Hundreds)
Hogs cut per man-hour (Units)
Hogs killed per man-hour (Units)
Weeks

Fig. 2—Man-hour curves showing operating efficiency of the plant over a period of 29 weeks, the man-hour ratios being based upon pounds killed, hogs killed, pounds cut and hogs cut. These curves show a slight increase in killing-gang efficiency

Moreover, certain changes in operating methods which had no true influence upon gang efficiency did not measurably affect the basic ratios. Changes in the times of starting or finishing work, payment to employees for overtime, a general 10 to 15-per cent wage reduction and other changes in hourly rates—none of these factors could distort the true picture of what was being accomplished by changes in production methods. In any other method than the man-hour, meticulous attention and considerable computation would have been necessary to exclude all such extraneous influences.

Since all costs are figured on a weight basis in the packing industry, the most significant ratios are those based on pounds per man-hour. Obviously, any fluctuation in the average weight per hog handled has a roughly corresponding influence upon the pounds killed or cut per man-hour. From an operating standpoint, experience shows that an increase of large amount in weight per hog will lead to a decrease in efficiency, in Fig. 1 (curve 3) where its comparison with curve 2 gives a picture of the constancy of the man-hour ratio in the face of a widely varying volume of production, at the same time showing its sensitivity to change in operating volume.

Utilization of the man-hour with its manifold advantages as a measuring stick for managerial control is not confined to cases as difficult as the one which has been outlined. A simple case in the packing industry where a control unit might prove invaluable is that of measuring the efficiency of the floating labor gang in sweet-pickle or dry-salt coolers; the measuring ratio, of course, would be "Pounds Handled Per Man-Hour." Numerous other illustrations will occur to any plant manager; it is obvious that the unit is as applicable to other industries as to pork packing.

No perfect universal yardstick for measuring plant operation has yet been proposed, but the man-hour appears to be the one most adaptable to existing industrial practices. It has certain limitations, but, within the boundaries of practical application, it may prove of considerable assistance in meeting one of the major needs of present-day industry: trustworthy means of operating control. In internal plant management, uses of the man-hour are manifold: given a standard set of fundamental figures, its possibilities in comparing plant with plant are even more numerous.

Analysts, especially of banks and other financial institutions, seek to find in the various ratios derived from analyses of profit and loss statements a reflection of the efficiency of a company's management. While financial ratios are of value in comparing one period of operation with preceding periods, or for comparing companies of similar characteristics, they ordinarily cannot be used to find the comparative operating efficiencies of different branches of a business. Here and there, individual companies have secured a portion of the desired control by means of budgets, usually based on percentages of direct labor, but this means of measurement is subject to certain uncontrollable fluctuations, and is inapplicable to comparison of companies in different localities.

These shortcomings of financial ratios and budget systems do not apply to the man-hour, which, as Alford and Hannum* point out, is "measurable by an established unit, universal in its use in industry, easy to handle in computation, and influential in its effect on industrial operations."

*"A Basis for Evaluating Manufacturing Operation," by L. P. Alford and J. E. Hannum, *Transactions of the American Society of Mechanical Engineers*, 1929.

White Paint, Colors, and Skill Needed for Good Interior Finish

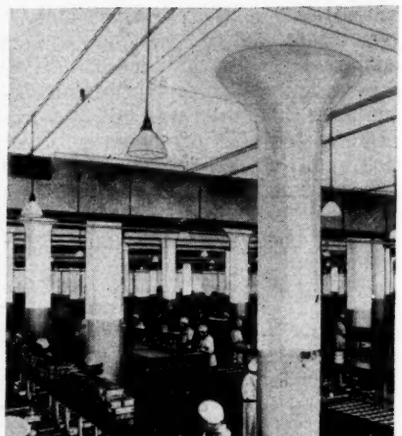
By **HERBERT CHASE**
Consulting Engineer
New York, N. Y.

WHAT are the best finishes for use in food plants? To this question there are many answers. Not that any one plant will necessarily employ a large number of different finishes, but rather that the number of good finishes available is large. Certain underlying facts about finishes are known to reliable and competent paint manufacturers, which should be understood by those who select the finishes used. Few paint makers are willing to discuss in detail the formulation of their products, but in general they are ready to furnish the types of finishes here described and will gladly tell the purchaser enough to assure his getting the type of product named.

Most food plant finishes must be capable of withstanding frequent washing. Likewise, a finish that is highly resistant to moisture is almost always required. White finishes probably always will be used on the largest areas of all industrial plants; not because white is more sanitary than colors but because it is primarily the best reflector of light that it is used almost exclusively on ceilings and upper walls.

An accompanying chart shows the superiority of white to colors in its light reflecting value. Its importance in this respect is evident when it is realized that reflected light, even in plants with maximum window space, provides most of the illumination required, especially in bays not adjacent to windows. Even a white surface that has become discolored with age often reflects only 10 per cent less light than when new. Where artificial illumination is required at least part of the day, as is nearly always the case, this difference must be made up by using more current if a uniform level of illumination is to be maintained. Plant superintendents have often found that savings in current consumed in lighting can be effected by refinishing white surfaces.

However, for dados — those lower areas of walls, partitions and columns— as well as for machines, benches and other equipment, colors are frequently considered better than white, partly because they form a better background against which the eyes are habitually directed, and partly because they show soil somewhat less than white. They can be kept equally clean, however, if the same methods and frequency of cleaning are applied as to white. Colors also have an important effect upon the cheerfulness or livableness of the room in which they are used.



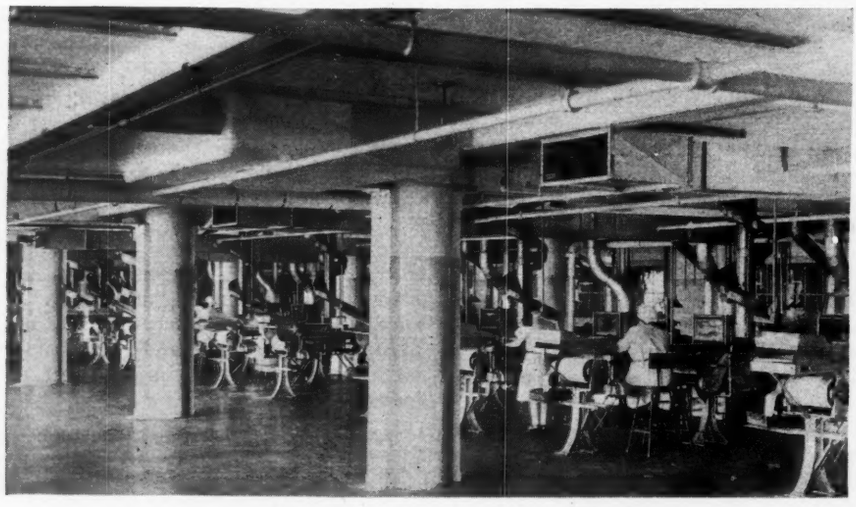
Packing room at Schrafft's has light buff dado and brown floor.

Orange, yellow and some shades of buff help to make a room feel warmer and are desirable in rooms that tend to appear cold. Greens and blues, on the other hand, run from cool to cold in their psychological effect, hence are best used in rooms that tend to be hot or warm. Gray, though often used for dados, produces a drab or cheerless effect, and has little to recommend it, especially in a "show" plant.

Dado colors have much less effect upon the illumination than those used on upper walls and ceilings, but it is well to keep them as light as possible and still produce the effect desired. Colors are recommended for use on machines and equipment in food plants, with worth-while benefits from the standpoint of workers.

Considering now the types and composition of finishes, the effect of moisture resistance probably stands first. Long experience has shown that for wall and most other surfaces, good grades of stand-oil, or boiled linseed oil, enamels are excellent. Their resistance to moisture is high, especially when some china-wood oil is used in the mixture, and they withstand frequent washing. Ordinarily they have considerable luster, but an increase in the pigment content will kill this or

Mint candy room in the plant of W. F. Schrafft & Sons, Charlestown, Mass. The ceiling and upper walls are white, as are the machines. A light buff is used for the dado and the floor is brown.



give a semi-gloss if this is desired. Glossy surfaces often tend to produce glare, but they are easiest to keep clean.

If still greater resistance to moisture is desired, some of the phenolic-resin finishes, on the order of the Bakelite and Durez materials, deserve consideration. They are reported to have the highest moisture resistance of any common finish, and in addition are resistant to most weak alkalis and to some acids. These types of finish, however, have a greater tendency to discolor than good stand-oil enamels. The effect is quite noticeable in white and light tints, but may be entirely masked in darker shades that are quite suitable for some food-plant uses. Phenolic-resin finishes are now much used on laboratory benches and similar equipment, and their resistance to many ordinary chemical reactions make them very valuable in such applications. They undoubtedly can be used to good advantage on much food-plant equipment.

Films produced with all oil-type finishes, including most of the commoner paints and enamels, tend to discolor with age, and the lighter the finish the more this discoloration is likely to show. It can be masked to a considerable extent even in white finishes, however, if the proper high-strength pigments are employed. Among the best pigments in this and in some other respects for white and light tints are titanium oxide and high-strength lithopones, which retain their whiteness notably well. Other pigments are often mixed with these white pigments to produce tinted colors. Some pigments discolor themselves as a result of chemical reaction with the atmosphere; their use should be avoided when discoloration is to be minimized. Lead pigments, though excellent for some purposes, are barred in most food plants, especially when spray application is employed, because of their poisonous character. The same plants, however, use red lead as a primer on metal surfaces, applied by brush, without detriment, and find it excellent for this purpose.

Suggested Color Combinations for Food Plant Interiors

Type of Room	Color for Ceiling and Upper Wall Surfaces	Color for Dado
Rooms normally hot or warm...	White.....	Pea green or lighter green or light blue or turquoise
Rooms in which temperature averages 70 to 80 deg. F.....	White.....	Pea green or slightly darker green, lavender or light blue
Rooms normally cool or cold....	White.....	Buff or light yellow or tangerine
Excessively sunny rooms.....	Light cream tint or light blue tint	Sage green or light tan or medium blue
Rest rooms.....	Cream or pink tint.....	Pastel green or light gray
Cafeterias.....	Cream, light blue tint, light green tint.....	Light maroon, rose, orange or orchid

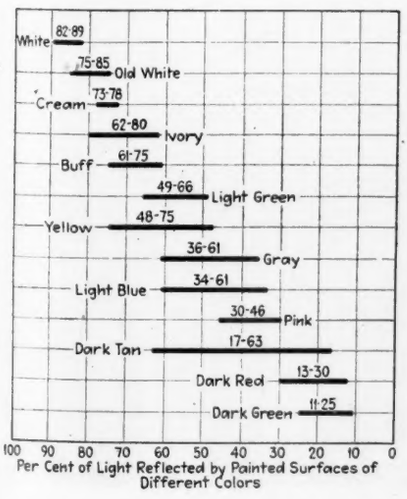
Note: The combinations listed are only a few of many that are entirely satisfactory, but are representative of good practice.

It should be remembered that skilled operators using modern spray equipment not only can cover more surface per day than brush painters but can do it with much less spray dust and other inconvenience than is commonly supposed. Machines and other equipment under ceilings being sprayed, naturally must be well protected by a cover, but a good operator can spray wall surfaces with little if any need for covering floors or other adjacent surfaces. By using a suitable board for a mask he can spray dados with a color different from that of the upper wall and produce a sharp, straight line of demarcation between the two.

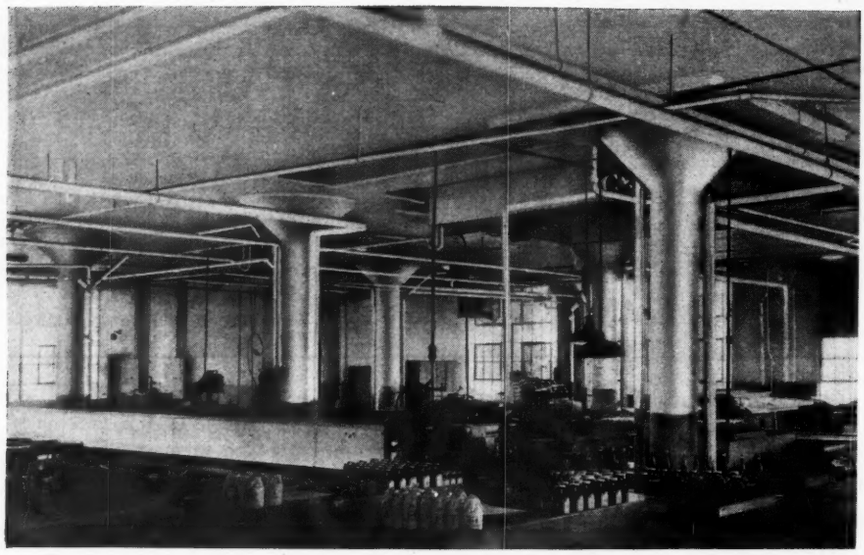
Plaster, concrete, brick and other surfaces that contain lime, if not previously painted, or surfaces where old paint has been removed should always be sealed with a good spar varnish or other lime-resistant sealer, or impregnated with zinc sulphate solution. When dry, a flat coat, usually a mixture of oil and varnish fairly high in oil and containing considerable pigment, is generally added, and should be thoroughly dried before the final coat is applied. When three-coat jobs are barred because of expense, the flat coat can be omitted if the final coat has sufficient covering power to hide the under surface.

On metal surfaces, the same flat and finishing coats can be used, but a metal primer is employed in place of a sealer. On iron or steel, the primer should have a rust-inhibiting pigment mixed in a vehicle giving good adhesive properties and of such a character as to remain flexible, so as to expand and contract with the metal when the latter changes dimensions with changes in temperature. Vehicles of linseed and china-wood oil, containing high percentages of red lead or of basic lead chromate, make excellent primers for ungalvanized iron and steel surfaces. An excellent primer for galvanized iron surfaces, one that is equally good for those not galvanized, as well as being especially good for heated surfaces, is made up as follows: To one part by weight of a mixture containing 80 per cent of raw linseed oil, 15 per cent of thinner, and 5 per cent of oil dryer, add four parts by weight of a pigment containing 80 per cent zinc dust and 20 per cent of zinc oxide. This primer adheres well to a properly cleaned galvanized surface, as well as to black (ungalvanized) surfaces, and the zinc pigments help to keep the film distensible.

For finishing coats on hot surfaces that do not attain a temperature above



The cafeteria at Schrafft's contrasts sharply with workrooms. Warm maroon dado, cream colored walls and ceiling with blue, orange, and red decorations, replacing a former spotless white, are credited with increased production during hours following the lunch period.



One of the production departments in Crosse & Blackwell's new plant at Baltimore.

350 deg. F. some of the newer glyptol enamels have given excellent results and with white and light tints are likely to discolor less noticeably than enamels made from ordinary drying oils, especially if the pigment is properly selected for the purpose. The white pigments already referred to are excellent in this type of enamel. Glyptol enamels usually are made for spray application but can be obtained for brushing. In either case the coats over which it is applied must be thoroughly dried, as otherwise the glyptol enamel may tend to loosen them and cause early failure of the finish.

The only way to prevent sweating of cold surfaces is to apply an insulating coating through which the heat will not be transmitted fast enough to cause condensation on the surface. In cases where the humidity is high and the surface is very cold, an insulation of cork an inch or more in thickness may be necessary. In certain other cases, however, sufficient insulation can be applied in the form of granulated cork either mixed in a suitable vehicle or sprinkled as heavily as possible on the surface after it has been painted with the vehicle and the latter is still wet. The vehicle may be a spar varnish or even a paint, but a mixture consisting of 30 per cent boiled linseed oil and 70 per cent of menhaden oil is recommended, because it does not become hard for a long time.

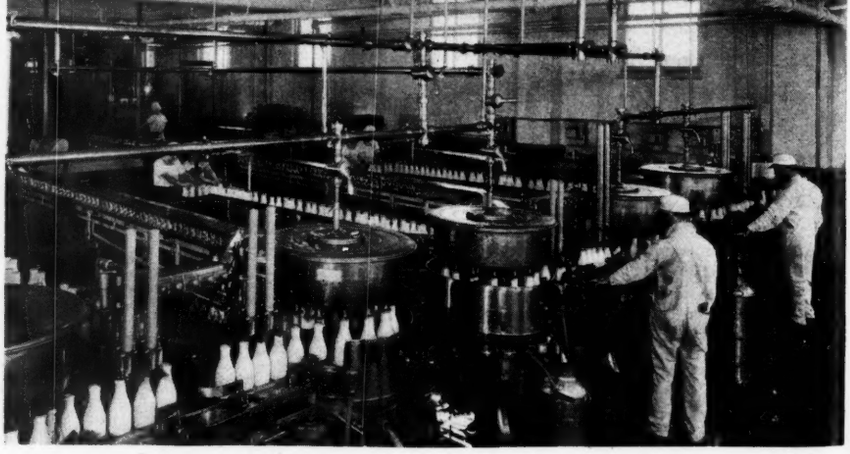
A surface covered with cork in this way is somewhat rough and if moisture is formed on the surface it does not tend to form drops so readily as on a smoother surface. The surface treated with cork can be given a coat of spar varnish sealer and then can be finished in the same manner as a wall surface. In one food plant which I visited recently some refrigerated pipes with heavy molded cork insulation had been taped over the cork, after which the tape was finished with aluminum paint. Just how this finish will stand up is not known, but it is probable that with the aluminum paint it will absorb less heat than with a finish containing no flake metal. On hot surfaces, such as steam radiators, flake metal final coats, such as aluminum or bronze, reduce the amount of heat given off as much as 17 per cent in some cases.

Although concrete floors in food plants are not always finished, the practice is recommended in the interest of cleanliness and to prevent dusting off of the surface itself. Spots on painted floors will wear through in time, but often it is not necessary to refinish the entire surface. To prevent such spots from showing up, the color selected is often one to match the concrete. Light floor colors help illumination, and the frequent washing desirable in food plants makes fairly light colors feasible.

New concrete floors must be dry and should be treated with a zinc sulphate solution before finishing (2 lb. per gallon) to help neutralize the lime and to dehydrate the surface. When this solution has dried, the surface should be dry-brushed before painting. A good floor enamel should then be applied. Such enamels usually are high in gum content to help insure good adhesion and improve toughness. The phenol-formaldehyde type of enamel is excellent because it is resistant to alkalis, to moisture, and to abrasion. Whether this or another type of enamel is used, at least three coats are recommended. If fast-drying materials are used and ventilation is good, coats can be applied with six-hour intervals for drying. Old concrete floors can be finished in the same way as new ones, but the zinc sulphate treatment can be omitted. On wood floors not previously finished, the initial coat should be an oil stain, which should be allowed to dry 48 hours before the enamel coats are applied.

Proper selection of the colors employed has a worth-while effect upon the morale and the efficiency of workers. In plants outside the food industry pleasingly painted equipment and interior surroundings are known to have decreased eyestrain, reduced fatigue, increased pride in work and cleanliness, reduced defective output and improved production rates. Can it be doubted that similar results may easily be obtained in the food plant if similar methods are followed?

Bottling room in the Abbotts Dairies. White upper walls and ceilings help greatly the light dispersion. Light yellow or tangerine on dado and machines would help to make such a room still more cheerful.



Recent Developments in Ice Cream Manufacture*

By M. J. MACK
Assistant Professor of Dairy Industry
Massachusetts State College

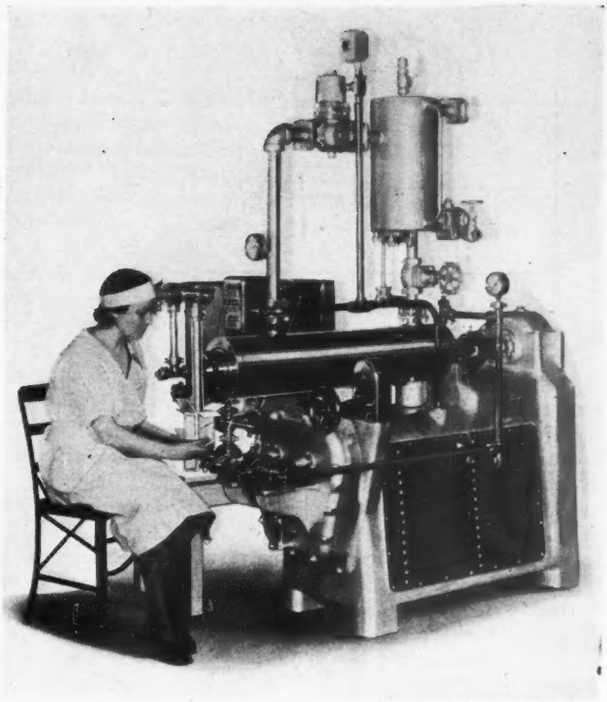


Fig. 1—In the Vogt continuous freezer the ice cream is frozen in a few seconds. Small packages may be filled from the freezer.

Courtesy of Cherry-Burrell Corp.

THE wholesale manufacture of ice cream has quadrupled since 1910, while the annual per capita consumption has increased to 3 gal. per person during the same time—an increase of nearly 300 per cent. Today there are at least 4,000 wholesale ice cream plants in the United States which produce 345,000,000 gal. of ice cream annually. Six billion pounds of milk is required for this quantity of ice cream, or the product of about 1,335,000 dairy cows. In addition to the dairy products which are used in the production of ice cream, 590,000 bbl. of sugar, 5,000,000 lb. of food gelatin, hundreds of gallons of vanilla and other extracts, and large quantities of fruits and nuts are utilized in ice cream. These few figures clearly indicate the importance of ice cream manufacture to agriculture and allied industries.

Since the industry has been growing so rapidly in recent years, one would expect a parallel growth in technical knowledge of ice cream manufacture. Unquestionably this has occurred. At the present time research is being conducted on ice cream problems in the Bureau of Dairy Industry of the U. S. Department of Agriculture, in a majority of the state agricultural experiment stations, and in many commercial laboratories. The findings of the various investigators have changed many of the accepted plant practices and have brought forth corresponding changes in plant equipment.

Briefly, the manufacture of ice cream consists of: (*a*) combining milk products, sugar, and gelatin in proper proportions to obtain a product of the desired composition; (*b*) pasteurizing the mixture as a sanitary measure and safeguard against the presence of pathogenic bacteria, as well as a means of getting the dry ingredients in solution; (*c*) emulsifying the fat by homogenizing at pressures usually around 3,000 lb. per square inch, cooling the mixture to a temperature below 50 deg. F. and aging for several hours; (*d*) freezing, and (*e*) hardening. Until recently a large part of the experimental work was concerned with the steps prior to freezing, commonly referred to as processing. Therefore, such questions as the effect of the quality and proportion of ingredients, pasteurization temperatures, homogenization pressures, and aging time and temperatures have been fairly satisfactorily answered.

At present, freezing and hardening methods are receiving considerable attention. Various types of batch freezers and a continuous freezer are on the market. The batch freezers may be either vertical or horizontal in construction. They vary in capacity from 20 to 200 qt. Either brine or liquid ammonia may be the refrigerant, which is circulated through an insulated jacket surrounding the freezing cylinder. The freezing process consists of freezing the ice cream to a semi-solid state and, at the same time, incorporating air into the mix. The internal mechanism of the freezer consists of dasher blades, which revolve rapidly enough to keep the freezing wall free from ice crystals, and of the beater, which aids in heat transmission as well as air incorporation. Incorporation of air prevents a soggy product and increases volume; this increase in volume usually is termed overrun.

At present "quick-freezing" is being applied to a large variety of food products. It is a relatively new development in the frozen preservation of meats, fish, fruits and vegetables. The quick-freezing methods employed in the processing of the foods just named, however, are not nearly as rapid as those employed in any ice cream plant. Whereas ice cream is frozen usually in less than 10 minutes (see Fig. 2), meats, fruits and vegetables require up to two or more hours to freeze. In this respect the quick-freezing of these products more nearly corresponds to the hardening, rather than the freezing, of ice cream, both in respect to time and methods employed.

It is an established fact that mixtures containing water have smaller ice crystals when frozen quickly than when

*Published as Contribution No. 146 of the Massachusetts Agricultural Experiment Station.

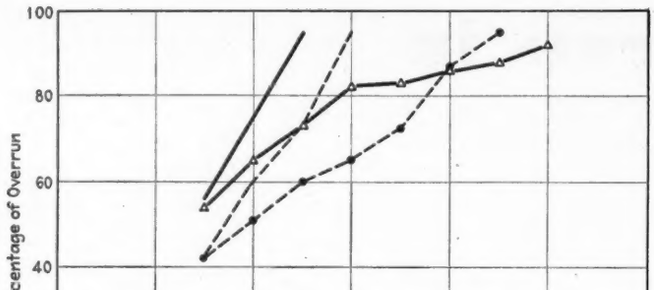


Fig. 2—The difference in freezing efficiency of the old and new freezers is entirely due to improvements in freezer design; all machines were in excellent condition.

permitted to freeze at a slow rate. Therefore it is important that both freezing and hardening be accomplished as quickly as possible. In the freezing of ice cream, both the rapidity of freezing and the percentage of the water which is frozen in the freezer are very important factors affecting the texture of the finished product. When ice cream is drawn from the freezer, only 15 to 30 per cent of the water has been frozen to ice. The water continues to be frozen more slowly during hardening until about 70 per cent has changed to ice. Therefore it is evident that very rapid freezing of ice cream in the freezer is essential, because more and smaller ice crystals will be formed. These crystals act as nucleuses for the slower freezing during hardening. The present practice of rapid freezing and drawing ice cream from the freezer in as stiff condition as possible without sacrificing time and overrun is essential if smoothness of texture is to be obtained. The result is a larger percentage of water frozen as small crystals in the ice cream freezer and less water to enlarge these crystals during hardening.

The Vogt freezer (Fig. 1), which has been developed recently, accomplishes very quick freezing. The ice cream passes through this freezer continuously in a freezing chamber of relatively small bore, freezing being accomplished in a few seconds. When the machine first came on the market, it was evident that the more rapid freezing produced an ice cream of smoother texture than that made in the batch freezers then in use. As a result, manufacturers of batch freezers were stimulated in their efforts to produce machines capable of greater freezing efficiency. Consequently several makes of both brine and direct-expansion freezers are now being sold which are capable of finishing a batch in about five minutes, the actual time varying with the coldness of the freezing medium.

In our laboratory at this college, new brine and direct-expansion freezers have been installed within the past year. These replaced older machines of the same make. The extent to which the manufacturers of these machines have increased the efficiency of the freezers is illustrated in Fig. 2. The direct-expansion freezer has been increased 100 per cent in freezing efficiency, while the brine freezer also has been greatly improved. The ice cream made in these freezers is noticeably smoother in texture than that made in the machines which froze the ice cream more slowly.

Ice cream is drawn from the freezer in a semi-solid condition, either directly into ice cream cans of 1 to 5 gal. capacity or is transferred to machines which fill packages. The cans or packages of ice cream are then transferred to "hardening" rooms.

The majority of hardening rooms are held at about —10 deg. F. and are of the still-air type. Under these conditions, at least 24 hours is required to harden 5-gal. cans of ice cream and 6 to 8 hours for packaged goods. Ice cream which has been carefully blended and frozen is noticeably coarsened in texture by slow hardening. Furthermore, a considerable length of time is required before the ice cream is firm enough for shipment. At the present time, more and more manufacturers are equipping hardening rooms with high-speed fans with induction motors to circulate the air. This type of hardening room is much more satisfactory because the ice cream is hardened in one-third to one-half the usual time and, as a result, is much smoother in texture.

The method of arranging cans in the hardening room also is an important point. Where cans are stacked close together in a large pile, cold air is kept away from the cans in the interior of the pile. Therefore slow hardening is the result. The cans should be so arranged that the cold air may be circulated around all the cans. If this precaution is taken a smoother, better blended ice cream will result.

As freezing equipment has changed, our methods of processing the ice cream mix (all ingredients except flavor) have been changing to meet the different requirements. A few years ago it was believed that a heavy bodied, viscous mix produced ice cream of the best quality. Consequently low pasteurization and homogenization temperatures, long aging periods, and an excessive gelatin content were employed to increase viscosity. But these and other factors cause slow whipping of the mix with present types of freezers. Consequently mixes are now processed with the purpose of securing less viscosity, which permits faster cooling and whipping in the freezer.

Higher temperatures for both pasteurization and homogenization are now employed in many ice cream plants. Temperatures between 140 and 150 deg. F., with a half-hour holding period, were quite generally accepted for pasteurization; homogenization being done immediately after pasteurization and at the same temperature. Many manufacturers are finding that temperatures of 160-170 deg. F. for both processes are more satisfactory. The advantages of higher pasteurization and homogenization temperatures have been shown by Dahle and Barnhart[1] to be lower viscosity, greater protein stability, less clumping of the fat globules, and a quicker freezing ice cream mix.

Aging the mix at a low temperature before freezing has been practiced for years. The object of aging is to improve the whipping ability of the mix and the body and texture of the finished ice cream. During the aging period, hydration of the gelatin and, to a lesser extent, of the milk proteins takes place; the fat becomes solidified and partly forms into clumps. Although manufacturers thought that at least 24 hours was necessary for the full benefits of aging, Hening,[2] Olsen,[3] and Dahle, Keith and McCullough[4] recently published findings showing that practically all the value of aging is obtained in the first 4 hours. Therefore only a short aging period is necessary and would appear to be highly desirable from the commercial viewpoint.

Those ice cream mixes which have a tendency to be high in viscosity, due to excessive clumping of the fat globules, as in butter or frozen cream mixes, whip rather slowly. Noticeable improvement may be obtained with such mixes by processing them in a homogenizer with the two-stage valve. The value of the second homogenizing valve is that fat clumping is largely prevented by it. Thorough emulsification of the fat is secured with the modern homogenizer. As a result, less gelatin is necessary to obtain smoothness. Con-

sequently, manufacturers are now using less gelatin in ice cream. Because gelatin is an overrun deterrent, the use of smaller quantities results in a more rapid whipping mix.

If the reader is interested in a more complete discussion of the processing and freezing of ice cream and the many related points, he should find either of the recently published books[5, 6] on ice cream making of considerable value. The books also contain many formulas for making ice creams of different flavors. The manufacture of fruit ice creams and ices and the freezing (cold packing) of fruits for use in frozen dairy products is discussed in a recent publication[7] of this college.

During the past few years rapid advances have been made by ice cream manufacturers in sanitation and control. Two factors previously discussed, higher pasteurization temperatures and shorter aging periods, have significant value in reducing the number of bacteria in ice cream. Other improvements in sanitation are the more sanitary construction of pasteurizing vats, homogenizers, pumps and other equipment, and the more general use of chemical sterilization to supplement hot water and steam.

No longer is there any question about the ability of ice cream manufacturers to supply a product of low bacteria content. To do so, it is necessary to watch the quality of the raw materials that are used. Careful pasteurization and aging for a reasonably short period of time well under 50 deg. F. also are essentials. All equipment must be carefully washed and sterilized. Careful inspection of the distributing points, often neglected, must also be performed.

Sanitary regulations for ice cream have been enacted by a few states and many cities. Four states have set maximum legal standards for bacteria. Many cities and towns have such standards and also require pasteurization of the ice cream mix and periodic inspection of plants. The prediction of Fabian,[8] that during the next few years a majority of the states will enact laws establishing a maximum bacterial standard and greatly increase their existing sanitary requirements, will undoubtedly be realized.

Due to present economic conditions, many changes are occurring in the sales end of the ice cream business. There is a fairly general feeling among manufacturers that there should be a downward adjustment of prices, based on lower ingredient and labor costs. In some territories this readjustment has already occurred. Price cutting, secret rebates, free services to dealers, and other uneconomic practices have increased and will undoubtedly be a source of trouble until business conditions improve.

A lower priced packaged ice cream containing just enough butter fat and milk solids to meet state standards has appeared in most territories. In some cities, chain stores are distributing this lower priced package. Although this product probably is increasing the total volume of ice cream sales, it is reducing the sales of the higher quality ice cream sold through the usual outlets at a higher price. The lower priced packaged ice cream undoubtedly will pass from the market when the buying power of the public improves.

Still another method of selling ice cream, particularly in New England, is through attractive roadside salesrooms, known as "dairy cottages." They are located on heavily traveled roads between large cities or in sections where tourists traffic is particularly heavy. These dealers often freeze the ice cream on the premises. The ice cream is of very high quality, usually containing about 20 per cent butter fat, and of 15 or 20 different flavors. Ample parking space is available around the cottage and the customer may be served in his car. In many of these salesrooms only ice cream is sold, but often milk drinks also are carried, and, in some cases, confections and other products. Although the ice cream usually is frozen on the premises, many of the dealers purchase the ice cream mix from a larger ice cream plant or creamery.

The average ice cream manufacturer, retailing his product through a roadside shop or dairy cottage, sells ice cream of better than average quality and has given rise to a type of business which undoubtedly has increased the consumption of ice cream and has reached consumers for sales that otherwise would have been lost to competing industries. This method of selling ice cream unquestionably is here to stay.

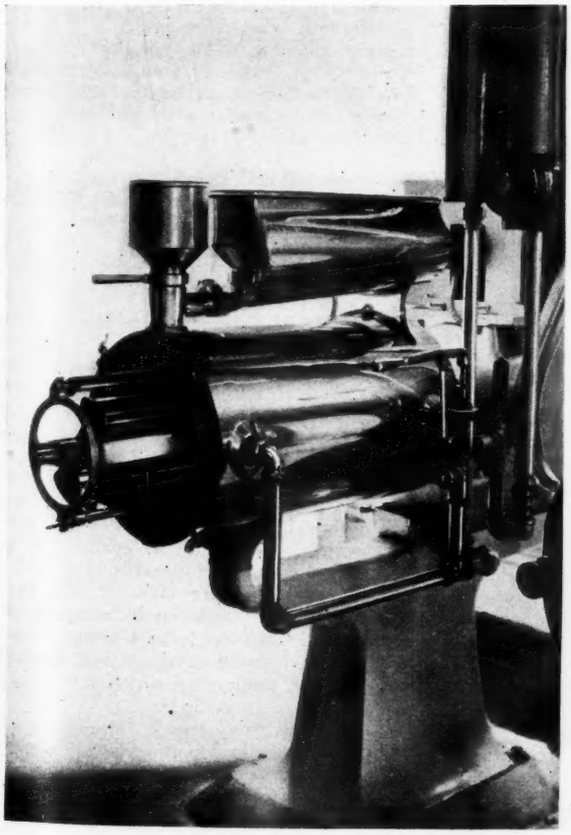


Fig. 3—A brine freezer with the head taken off and dasher partly removed to show the two parts of the dasher, the scraper blades and the beater, which rotate in opposite directions.

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BOOK REVIEWS

COLLOID ASPECTS OF FOOD CHEMISTRY AND TECHNOLOGY. By William Clayton. Published by P. Blakiston's Son & Co., Inc., 1012 Walnut St., Philadelphia, Pa., 1932. 571 pp., 7x10; 64 illustrations, 82 tables; cloth. Price, $8.

ADMITTEDLY an introductory guide to aspects and problems of a colloid nature which may be unfamiliar to the food chemist, this volume does not include an exhaustive study of each subject dealt with. It does cover such a wide range of physico-chemical phases of food chemistry, hitherto not assembled in book form, that any food chemist or technologist will find it a helpful reference work.

The practical yet scientific turn of the author's mind is well shown by the logical arrangement he has given the facts gathered from journals, research bulletins, patents, and other books on colloids. This presentation cannot help but stimulate the food technologist to greater interest in the colloidal behavior of his raw materials and the effect of this colloidal behavior on the finished product. Further study is encouraged by the list of references to literature and patents given at the bottom of each page. Over 2,000 of these references are compiled in a comprehensive bibliography under appropriate headings. Just why all of these references are not included in the bibliography is not apparent. An author, as well as a subject, index assists in making this book a useful reference volume. A glossary of colloid and physico-chemical terms is given for the reader or student not familiar with such terms.

As chief chemist and bacteriologist in the employ of a large food manufacturing concern, Crosse & Blackwell, Ltd., the author has an excellent opportunity to realize the need for such a compilation in which colloid information is interwoven with facts concerning food chemistry and technology. A brief introduction to the scope of colloid chemistry is followed by successive chapters pertaining to gums, proteins, gelatin, cereal products, emulsions, milk, nutritional chemistry, sugar technology, jellies and jams, and brewing.

Great as is the interest in these subjects there is at present greater economic interest in the two final chapters, respectively devoted to freezing and thawing of foods and to the treatment of water and factory wastes. E. S. STATELER.

* * *

COST SURVEY AND OPERATING BUDGETS FOR THE CARBONATED BEVERAGE INDUSTRY. American Bottlers of Carbonated Beverages Educational Bulletin No. 2 (revised edition). Published by A.B.C.B., Bond Building, Washington, D. C. 33 pp.; paper. Price, $1. to non-members.

COST analyses of typical companies of different sizes and types form the basis for a summary of unit costs in all parts of the carbonated beverage industry. On the basis of these actual unit costs, developed through a survey by Arthur E. Low & Co., certified public accountants of Chicago, this bulletin presents suggested operating budgets and means for their application in the industry. Those in other food industries may find many interesting suggestions for the analyzing of costs and formulation of budgets in their own business. A means for adapting the beverage system to other industries will be more or less obvious because of the clearness and completeness of this report.

* * *

THE CHAIN STORE—BOON OR BANE? By Godfrey M. Lebhar. Published by Harper & Bros., 49 East 33d St., New York, N. Y., 1932. 206 pp., 6x8¾; cloth. Price, $3.

INTIMATE contact with various chain-store organizations and a thorough knowledge of their problems has enabled Mr. Lebhar to present the case of the chain store concisely and well. The book is substantially a brief in which most of the important objections to the chain store are recognized and quite fairly and frankly answered.

It appears that the author has strived to collect the most effective ammunition with which to annihilate the chronic objectors or political spellbinders that in many sections of the country make capital out of anti-chain-store sentiment or organize attempts to legislate or tax the chain store out of business. Since the book obviously intends to support the contention that the chain store has been a boon, the author might have made out a still stronger case, if he had more effectively exploited the beneficial influence that chain-store competition has had on the practices of independent merchants. O. FRED ROST.

* * *

INDEX TO THE LITERATURE OF FOOD INVESTIGATION. Vol. III, No. 2, September, 1931. Compiled by Agnes Elisabeth Glennie, Department of Scientific and Industrial Research, Food Investigation Board. Published by His Majesty's Stationery Office, Adastral House, Kingsway, London, W.C.2, 1932. 163 pp., 6x9⅝; paper. Price, 2s. 6d.

WITH the United Kingdom now definitely embarked on a live-at-home campaign, backed by the ever increasing popularity of the "Buy-British" slogan, it is only to be expected that the Imperial Research Conference would place every possible facility at the disposal of the growing food industry of Britain. This index to the literature of food investigation is a part of the larger plan to make the country as nearly economically independent as possible. To a firm or an individual engaged in research or development work in the manufacture of foods, this index will be a valuable aid in searching for information, but it should be understood that it is an index to *investigations*, not to operations. In other words, it is a collection of abstracts of published researches and it is not of great value to food engineers engaged in activities outside of research and development.

One engaged in research will find it a useful aid in literature searches, but other familiar sources, such as Chemical Abstracts, and the Industrial Arts Index must also be consulted. Its inclusion of some material of doubtful scientific research value from certain non-scientific American sources, and failure to include other material of a valuable nature, though not presenting new data, is difficult for the reviewer to understand.

* * *

AN ANALYSIS OF ICE CREAM SALES. Published by International Association of Ice Cream Manufacturers, Harrisburg, Pa., April, 1932. 8 pp., 6x9; paper. Price, $1.

BASED on the 18th General Survey Bureau of Service and Statistics, this Special Bulletin No. 37 presents an analysis of bulk, package, specialties, and ice cream bar sales and the styles and sizes of packages sold during 1930.

In the United States, packaged ice cream represented 13.59 per cent of total sales, a gain of nearly 2 per cent in five years. In Canada, 14.57 per cent of total sales were in packaged form. Rectangular packages were favorites in both the United States and Canada. Cups were second choice.

* * *

HEALTH DEPARTMENTS OF STATES AND PROVINCES OF THE UNITED STATES AND CANADA. Public Health Bulletin No. 184 (Revised). 785 pp.; paper bound. Price, 75 cents. (Orders should be addressed to Superintendent of Documents, Government Printing Office, Washington, D. C.)

A REVISED edition of a similar directory issued in 1929, this volume gives not only a list of the agencies but describes their authority, scope of activities, and methods of administration, research and field work. It is a compendium of reference information which will be extremely valuable to any producer who is dealing with health or public-safety problems in the course of sale or distribution of any of his goods.

* * *

VEGETABLE FATS AND OILS. By George S. Jamieson. Published by the Chemical Catalog Co., Inc., 419 Fourth Ave., New York, N. Y., 1932. 444 pp., 6⅝x9¼; 2 illustrations; cloth. Price, $6.50.

ADMIRABLY summarizing the most reliable work carried out in the field of fats and oils, this latest addition to the series of American Chemical Society monographs is a reliable reference source for any technical or research laboratory. As chemist in charge of the oil, fat and wax laboratory in the Bureau of Chemistry and Soils, U. S. Department of Agriculture, the author has a perspective of this subject which enables him to evaluate in an understanding manner what should be included in a reference book of this kind. All readers will immediately recognize his encyclopedic knowledge of his subject and will approve of the thorough and detailed, yet compact, manner in which this knowledge is made available.

Lewkowitsch's system is followed in dividing the oils into non-drying, semi-drying and drying oils. A generous chapter is given to fatty acids, alcohols, sterols, hydrocarbons, phosphatides, and analytical

and plant control methods. Adulterants of these fats and oils and methods of detecting them are included. Specific bibliographies, listed in the body of the text for each fat, add to the value of the book. A useful appendix including tables, index of botanical nomenclature, and subject index, gives completeness to a monograph of this kind. S. Józsa.

* * *

STANDARDS YEAR BOOK, 1932. Bureau of Standards Miscellaneous Publication No. 133. 394 pages; cloth. Price, $1. (Orders should be addressed to Superintendent of Documents, Government Printing Office, Washington, D. C.)

IN the annual résumé of standardization activities throughout the world is given a review of the major results obtained in the Bureau of Standards itself during the fiscal year preceding the date of issue. The volume includes a very complete directory of all types of standardizing agencies active, both national and international in scope, and a résumé of new specifications adopted.

* * *

Books Received

POWER PLANT MANAGEMENT. By Walter N. Polakov. McGraw-Hill Book Co., New York, N. Y.

STRUCTURE AND COMPOSITION OF FOODS, Vol. I. By Andrew L. Winton and Kate Barber Winton. John Wiley & Sons, Inc., New York, N. Y.

WORLD ECONOMIC DEPRESSION. Secretariat of League of Nations, Geneva.

INTERNATIONAL WHEAT CONFERENCES DURING 1930-31. Food Research Institute. Leland Stanford University.

FOODS IN HEALTH AND DISEASE. By Lulu G. Graves. The Macmillan Co., New York, N. Y.

AGRICULTURAL CRISIS, Vol. II. By Economic Committee, League of Nations, World Peace Foundation, Geneva.

FOOD PREPARATION. By Marion Deyoe Sweetman. John Wiley & Sons, Inc., New York, N. Y.

FINANCIAL RESULTS OF SPECULATIVE HOLDINGS OF WHEAT. Food Research Institute, Leland Stanford University.

BROWNE'S GOLD STORAGE, TEMPERATURES, AND HUMIDITY CHART. By Milton W. Browne. Milton W. Browne, Kansas City, Mo.

ANNUAL SURVEY OF AMERICAN CHEMISTRY. By Clarence J. West, National Research Council. Chemical Catalog Co., New York, N. Y.

CHEMISTRY AND COOKERY. By MacLeod and Mason. McGraw-Hill Book Co., New York, N. Y.

CONSUMPTION OF MEAT AND MEAT PRODUCTS. By John H. Cover. University of Chicago.

ESSENTIALS OF ORGANIC AND BIOLOGICAL CHEMISTRY. By E. Wertheim. The Chemical Publishing Co., Easton, Pa.

JOBS, MACHINES AND CAPITALISM. By Arthur Dahlberg. The Macmillan Co., New York, N. Y.

WHAT'S ON YOUR MIND?

More About Cocoa-Milk

McGraw-Hill Publishing Co., Inc.
Gentlemen:

Our client the Krem-Ko Co., of this city, has called our attention to the July, 1932, edition of one of your publications, entitled FOOD INDUSTRIES, in which there appears, on pages 231 *et seq.*, an article entitled "Cocoa-Milk Beverages Require Technical Control," by Herbert B. Larner.

This article recites, on page 231 (second column), two formulas for making a chocolate-milk beverage, using tapioca flour, and recites, on page 232 (second column), a process of sterilization involving heating the product to a temperature of 240 deg. F. for a period of 15 to 20 minutes. The article, on page 231, also suggests the use a agar-agar as well as various vegetable gums.

Doubtless this article was published by you without knowledge of the fact that the process described therein is covered by United States Letters Patent 1,710,504 (which involves the use of agar-agar), 1,710,505 (which involves the use of vegetable gum), and 1,710,507 (which involves the use broadly of a thickener). All of these patents were granted April 23, 1929, in the name of Charles E. North, and were assigned to the Dairy Drink Co., of Chicago, and later assigned to the Krem-Ko Co., aforesaid. Copies of these patents are inclosed.

One company—namely, the Heyman Process Corp. of New York—is now being sued for infringement of patents 1,710,504 and 1,710,507.

The article referred to is decidedly misleading in intimating that the process described is available for public use without the consent of the Krem-Ko Co. Such an intimation is incorrect in view of the patents above referred to. You will appreciate, of course, that the publication of this article in your magazine is very likely to mislead the members of the public into believing that they may practice the process described in the article without the consent of the Krem-Ko Co.

If any member of the public is misled into infringing the Krem-Ko Co.'s patents aforesaid, said member of the public will of course subject himself to liability for the payment of damages to the Krem-Ko Co. Needless to say, your company, in publishing this misleading statement, would be jointly liable.

We feel sure that your act in publishing this misleading article was done without appreciation of the facts and that you will welcome the chance to fully inform your readers, with the same publicity given to the article complained of, that the process described in said article is not available to the public without a license from the Krem-Ko Co.

WILKINSON, HUXLEY, BYRON & KNIGHT
By Ralph Munden.
Chicago, Ill., July 7, 1932.

* * *

Still More About Cocoa-Milk

In the interest of developing the knowledge regarding cocoa-milk to its fullest extent, we give the names and dates of two other patents:

"Process for the Preparation and Conservation of a Liquid and Homogeneous Chocolate," granted to Joseph Talansier, Oct. 19, 1904. French patent No. 345,520, Class 11/4.

"Process of Treating Cocoa," U. S. Patent No. 1,076,122, to Henry Blount Hunter, Oct. 21, 1913.—THE EDITOR.

* * *

No Technical Values in Brewing or Wine Making?

To the Editor of FOOD INDUSTRIES:

I should like to give my reply to your question regarding incorporating material for the fermentation industries if the Eighteenth Amendment should be repealed. Since about thirty-six states have prohibition laws of their own, my guess would be that the majority of your patrons would still be in "dry" territory after the repeal of the federal act. The newspapers have seldom been able to make any distinction between "wets" and people who object to having local police work done by federal agents. In this section, at least, there are a great many children of people who, about seventy years ago, believed ardently in states' rights, and we still believe in states' rights.

Moreover, if there is a ruthless competitor of legitimate food industries, the alcoholic beverage industry is that. As a foods person I should be glad to forward every legitimate food industry, but I object seriously to having the official journal give "aid and comfort" to a rival which, without giving the consumer value received for his money, is likely to lessen his productive power, efficiency as a worker, and credit.

All this is quite aside from the question of whether there is or is not a law against alcoholic beverages. The fermentation industries have a legitimate place as producers of technical goods, but they are the rivals, not the colleagues, of the food industries when they enter the beverage field. So my vote is "No" as regards including them.

ADA M. FIELD, PH.D.
Food and Diet Specialist.
Newnan, Ga., July 8, 1932.

ABSTRACTS OF CURRENT LITERATURE

INCREASING THE VITAMIN-D CONTENT OF MILK. W. E. Krauss, R. M. Bethke, and C. F. Monroe. *Ohio Agricultural Experiment Station: Bi-monthly Bulletin,* No. 156; 1932.

Many attempts to increase the vitamin-D content of cows' milk have given indefinite and conflicting results except when cod-liver oil was fed. The quantity of cod-liver oil required to increase the vitamin-D content in milk had an appreciable depressing effect on the fat percentage of the milk. Such unsatisfactory results directed attention to irradiated ergosterol, the most potent source of vitamin D then known. The results of these studies gave rise to the conclusion that the vitamin-D content of milk can be increased many times by feeding irradiated ergosterol to cows without impairing the producing ability and physical condition of the cows. However, the cost of the ergosterol and the inefficiency with which it is transferred to the milk makes its general use prohibitive.

* * *

ULTRA-VIOLET ABSORPTION SPECTRA IN RELATION TO VITAMIN D. PART I, SECTIONS A AND B. John R. Loofbourow. *The Bulletin of Basic Science Research,* Vol. 3 (1931), No. 2, pp. 101-156.

The unanimous opinion is that provitamin D is not cholesterol but a contamination or transformation product of it. The majority of investigators hold that ergosterol is the one true provitamin D. Until further and more convincing dissenting evidence is presented, one must take the view that only ergosterol or its derivatives are capable of antirachitic activation. The activatability of various isomers and derivatives of ergosterol is a question which will be considered when the chemistry of ergosterol and vitamin D is studied by means of absorption spectra.

* * *

THE DESTRUCTION OF VITAMIN A BY ULTRA-VIOLET RADIATIONS. Robert J. Norris. *The Bulletin of Basic Science Research,* Vol. 3 (1931), No. 2, pp. 89-100.

Cod-liver oil irradiated in a closed quartz cylinder under carbon dioxide atmosphere by a 500-watt air-cooled quartz mercury arc showed wide discrepancy in estimated vitamin A when assayed by biologic and colorimetric methods. When judged by the antimony trichloride color reaction the irradiated oils showed as much as 50-75 per cent of their original vitamin activity, yet were practically inactive according to biologic tests. When subjected to an induction period up to one hour, biologic tests showed definitely that no vitamin A had been destroyed but rapid destruction resulted from a second one-hour induction period. Under the conditions of the experiments, complete inactivation occurred after eight hours of irradiation. Destruction of the color-producing substance results from a bimolecular reaction and is not definitely accomplished by an ultra-violet irradiation induction period within the time limits studied. These results give rise to the conviction that the chromogenic substance is not vitamin A and that colorimetric measurements cannot be relied upon to determine vitamin-A activity.

* * *

DECOLORIZING SOLUTIONS. V. Edelstein. *Z. Zuckerind. cechoslovak. Rep.,* Vol. 56, pp. 49-55; 1931. [From *Chemical Abstracts,* Vol. 26, p. 2885; May 20, 1932.]

Decolorization experiments with five activated carbons on a molasses to which had been added various salts in increasing concentration are reported in detail. Results are shown graphically. The decolorizing power of activated carbon is increased by the addition of salts to the molasses, acid salts such as copper sulphate having a greater effect than neutral salts. The decolorizing power decreases with increasing pH of the solution.

* * *

THE PROBLEM OF PRESERVING ORANGE JUICE BY FREEZING. M. A. Joslyn. *Industrial and Engineering Chemistry,* Vol. 24, pp. 665-668; June, 1932.

Oxidation appears to be the principal cause of deterioration in frozen orange juice, and it can be almost completely eliminated by de-aeration of the juice and handling under an atmosphere of inert gas. The commercial application of this method is feasible and yields a satisfactory product.

* * *

ULTRA-VIOLET ABSORPTION SPECTRA IN RELATION TO VITAMIN D. PART I, SEC. C. John R. Loofbourow. *The Bulletin of Basic Science Research,* Vol. 3, No. 3, pp. 201-236; 1931.

From this review of the literature on ultra-violet absorption spectra of oils it is concluded that at the present stage of development ultra-violet absorption spectra often fail to show the presence of ergosterol and vitamin D in oils in quantities that are important biologically. The bands are reliably positive only when the oils are rich in ergosterol. Qualitatively, the correlation between an absorption band with a maximum at about 3,280 Angström units and the presence of vitamin A seems established. Semi-quantitative relationship has been obtained, but the accuracy of this relationship is hindered by an indeterminate amount of absorption due to other and unknown factors. Differentiation of growth-promoting carotene from vitamin A is supported by the widely different ultra-violet absorption spectra of carotene and substances containing vitamin A. Considerable evidence is presented to indicate that carotene is changed to vitamin A in living bodies. Absorption spectra of liver oils from rats fed with carotene give proof of this change. Numerous liver oils and substances containing vitamin A have their ultra-violet absorption described, as do the acid fractions of these oils.

SHARP VERSUS DULL ICE CREAM FREEZER BLADES AND FREEZING EFFICIENCY. R. C. Munkwitz and Devoe Meade. *Bulletin No. 324,* University of Maryland Agricultural Experiment Station, College Park, Md.

Many ice cream plants have much capital tied up in freezer blades which have become so worn that they are unsatisfactory for use. The usefulness of these blades could have been prolonged indefinitely had there been available a machine with which these blades could have been sharpened. This contention was substantiated by a series of experiments made with dull blades followed by a duplicate set of experiments made with the same blades after sharpening. Load on motor was reduced, time of freezing was cut in half, whipping time remained approximately the same, overrun was increased 5-10 per cent, and texture was greatly improved after the blades had been sharpened. Commercial runs of 200 freezing hours with sharp blades and then with dull blades confirmed the results obtained in the experimental tests.

* * *

DISTRIBUTION COSTS (for Ice Cream). By O'Neal M. Johnson; International Association of Ice Cream Manufacturers (Price, $2).

Supplementing the association accounting system, this manual explains how to obtain the cost of serving and delivering ice cream to the different classes of dealers. With distribution costs known, unprofitable dealers may be eliminated.

* * *

THE FORMULA OF VITAMIN C. C. A. Robak. *Industrial and Engineering Chemistry, News Edition,* Vol. 10, p. 105; April 20, 1932.

Extensive experiments have shown that vitamin C is an orthodiphenol, present in larger quantities in ripe fruit. The pure material prevents scurvy in guinea pigs when administered in doses of 0.02 mg. a day. The discoverers have pointed out a simple way of producing the vitamin substance in large quantities from cheap raw materials.

* * *

RANCIDITY OF MILK DUE TO HOMOGENIZATION. W. Dorner and A. Widmer. *Lait,* Vol. 11, pp. 545-567; 1931. [*Chemical Abstracts,* Vol. 26, p. 1988; April 10, 1932].

Homogenization causes raw milk and raw cream to become distinctly rancid after a few hours. The development of rancidity increased as the size of the fat globules decreased. This rancidity was caused by a lipase. In unhomogenized milk the lipase acts so slowly that its effect cannot be readily detected. Homogenization considerably increases the surface of the milk fat, thereby exposing greater fat surface to the action of lipase, with consequent more rapid development of rancidity. The lipase in milk was found to be very sensitive to heat; holding milk at 55 deg. C. for 20 minutes affected its inactivation. It appears that only pasteurized milk or pasteurized cream can be homogenized without danger of rancidity. Mixtures of pasteurized and homogenized milk or cream with raw milk, raw skim milk or raw cream become rancid. When rancidity of milk occurs it is therefore suggested that the dairy machinery be searched for homogenizing effects.

Men, Jobs and Companies

INDUSTRY

BALLARD & BALLARD CO., Louisville, Ky., has discontinued production of its "Oven Ready" buttermilk biscuit in the dough until after high-temperature periods are over, on account of the difficulty in distributing and merchandising the product in hot weather. The trouble lay in retailers' keeping the product improperly refrigerated, with the result that the dough would rise and burst the package or else turn sour, if kept too long.

CAMPBELL SOUP CO. is adopting the federal plan for grading tomatoes this year and is constructing near its plant in Camden, N. J., a grading platform that will accommodate 24 truckloads of tomatoes at one time, with trackage for an additional 24 loads on the side opposite the grading stands. The Campbell venture will mark the first time graded tomatoes have been sent out of New Jersey.

THE GREAT ATLANTIC & PACIFIC TEA CO. has effected a working agreement with Montgomery Ward & Co. and has opened its largest and most elaborate store in the department store unit of Montgomery Ward between Minneapolis and St. Paul. The store occupies 15,000 sq.ft.

NATIONAL OIL PRODUCTS CO., Harrison, N. J., held a dinner conference of municipal health officers July 27 in connection with the control of vitamin D in foods, particularly milk. This conference, the first of its kind, signifies a step toward closer cooperation between manufacturers and health officials.

PURE MILK ASSOCIATION, Chicago, whose 18,000 members produce the bulk of the milk in the Chicago territory, became involved in court proceedings July 16 when its manager, Don N. Geyer, and 54 other officers and members were indicted on charges of conspiracy and unlawful assembly. The charges were based on evidence given by witnesses of the two-day milk riot at Union, April 11.

SCHWEFER'S BAKERY on North Clark St., Chicago, may be only a tiny 10x20-ft. shop, but it gets business. Of modernistic design, it was recently equipped with an air-conditioning unit as an added attraction. Furthermore, Mr. Schwefer, who has spent almost half a century in the baking business, contemplates a chain of bakeries of this type.

T. S. SIMMS & CO., LTD., Nova Scotia, has developed, after five years of research, a new process of apple dehydration said, by certain experts, to produce apples superior in grade, color and flavor to the California product.

STANDARD BRANDS, INC., is issuing licenses to dairies for production of vitamin D milk by the irradiated-yeast method. The vitamin is introduced into milk by feeding cows yeast which has been exposed to ultra-violet rays. Powdered irradiated yeast is being produced at the Fleischmann plant at Peekskill, N. Y.

UNITED FRUIT CO. plans to drop 1,800 acres of its banana plantations in Costa Rica, it is reported. Restrictive tariff, oppressive laws and the depression have caused the company to restrict its operations in Costa Rica for several years. The new tariff law prohibiting importation into England by giving preference to bananas grown in Jamaica and other British possessions was the immediate cause of the company's action.

UNITED SUGAR REFINERIES CO., Los Mochis, Sinaloa, Mexico, one of the largest sugar concerns in that country, has suspended operations until the Southern Pacific Railroad resumes traffic.

VANCOUVER MILLING & GRAIN CO., LTD., Vancouver, B. C., has been taken over by Spillers, one of the largest companies in the British Empire.

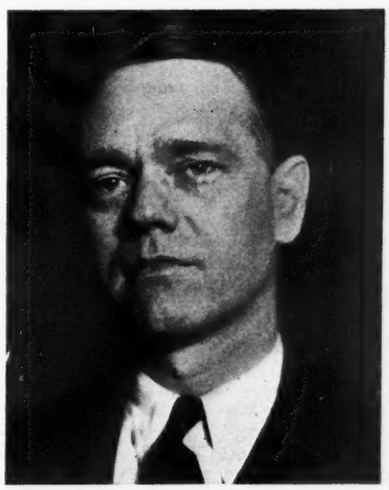
PERSONNEL

GEORGE F. DENT, manager of the Regina branch of Donald H. Bain, Ltd., has been appointed Western sales manager for General Foods, Ltd., with offices in Winnipeg.

C. A. HAWKINS, San Francisco fig grower, was elected president of California Peach and Fig Growers' Association, July 7, at a meeting of the cooperative's new board of directors, succeeding E. I. Feemster. M. J. Newhouse was retained as general manager after having previously resigned.

H. L. HAYES, formerly connected with Merrell-Soule Co., has been appointed Columbus and central Ohio representative for C. F. Mueller Co., manufacturer of macaroni and spaghetti.

HERBERT B. LARNER has been appointed special representative to the dairy industry to introduce Vitex, a vitamin D concentrate produced under the Zucker patents by National Oil Products Refining Co., Harrison, N. J. Mr. Larner was formerly



with the U. S. Public Health Service and was later in public health activities in North Carolina and New Jersey. He also was a director of KremKo Co., Chicago. The Zucker process is employed to extract vitamin D from cod liver oil, and the vitamin is introduced into whole milk by adding the concentrate to it.

WILLIAM F. ROBERTSON, formerly in charge of the fountain syrup department of Park & Tilford, New York, is now in the product department of California Fruit Growers' Exchange, New York office, working in the sales division.

FRANK C. RUSSELL, vice-president and member of the board of managers of the New York Coffee and Sugar Exchange, recently resigned his position as a result of being appointed manager of the New York office of the Grain Stabilization Corp.

J. C. RYAN, for twelve years assistant district manager for Hershey Chocolate Corp. at Columbus, Ohio, has been made manager of the district to succeed J. G. McBride, resigned.

OSCAR M. STOUT, manager of Park & Tilford's candy plant, New York, since 1929, left that company July 28 and joined Edgar P. Lewis & Sons, Inc., Boston candy manufacturers, as plant manager.

HENRY S. STURGIS, vice-president of the First National Bank of New York, has been made a director of General Mills, Inc.

CHARLES H. SWIFT was elected president of Cia Swift Internacional at a meeting of the board of directors of the company in Buenos Aires, July 11, to succeed the late Edward F. Swift. Alden B. Swift was elected a vice-president of the company.

JOSEPH L. WILLIAMS, assistant manager of Great Western Co.'s sugar plant at Brush, Colo., has been made manager of the company's plant at Loveland, Colo., to succeed Hugh Scilley, retired. Mr. Williams is succeeded by Homer Varner, field man for the Loveland plant for the past twelve years.

DEATHS

HENRY L. MEYER, 82-year-old retired Cincinnati meat packer, died July 21 after a brief illness. Prior to his retirement about 20 years ago, Mr. Meyer had spent more than 50 years in the management of the company bearing his name.

COL. JOSE M. TARAFA, colorful power in the Cuban sugar and railway industries, died of brain hemorrhage July 23 while in New York to attend conferences on the sugar trade. He was 62. Colonel Tarafa was president of the Central Cuba Sugar Co. and of the Cuba Northern Railways, and held a directorate in other important companies.

GEORGE M. ROLPH, former president of the California-Hawaiian Sugar Refining Corp. and War-time chairman of the Sugar Equalization Board, died July 21 of a paralytic stroke at the age of 59. Mr. Rolph, who was a brother of the California governor, resigned as president of the refining company last October because of ill health.

BENJAMIN NATKINS, former vice-president and general manager of the Nedick Orange Juice Co., committed suicide at his home in Morristown, N. J., July 24. Despondent over his poor health, Mr. Natkins drank poison, slashed his wrists and threw himself into a tank of vinegar to drown.

JOSEPH F. STILLMAN, an old-time prominent figure in the sugar industry, died July 18 after an extended illness. In his 84 years of life, Mr. Stillman served as manager of the American Sugar Refining Co., Boston, as head of the sugar business of Arbuckle Brothers and as head of the Edgewater, N. J., plant of Warner Sugar Refining Co., in the order named. He left the latter organization to retire in 1915.

THIS MONTH—

AUGUST

11—National Malt Products Manufacturers' Association, quarterly meeting, Hotel Sherman, Chicago, Ill.

24-26—Oyster Growers' and Dealers' Association, Ambassador Hotel, Atlantic City, N. J.

27-Sept. 10—Sixth International Congress of Refrigeration, Buenos Aires, Argentina.

—Western Confectioners' Association semi-annual meeting, Palace Hotel, San Francisco, Calif.

—AND THE NEXT

SEPTEMBER

12-14—National Coffee Roasters' Association, Denver, Colo.

21-23—American Fisheries Society, Lord Baltimore Hotel, Baltimore, Md.

—National Association of Bakers' Supply Houses, Detroit, Mich.; Donald W. Boyd, Secretary, 304 Michigan Ave., Buffalo, N. Y.

Hors d'Oeuvres

EUROPEANS apparently take American political gestures seriously. A Pilsner representative from Czechoslovakia is reported to have successfully approached Canada Dry Ginger Ale, Inc., with the proposition that it act as American distributing agency for foreign interests when the 18th Amendment is repealed.

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FRUITS and vegetables can be preserved indefinitely, with retention of all their fresh qualities, by packing them in an inert gas, it is claimed by the newly organized R. & L. Containers, Inc., Toledo, which plans to revolutionize the canning industry with its process.

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CANS OF SOUP carried by the third Arctic relief expedition to Major General Greeley a half century ago were opened recently and found good. Several cans of this historic soup were given to the Museum of Science and Industry by Libby, McNeill & Libby.

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SOUP, 1 cent; milk, 1 cent; hominy, 1 cent; et cetera. Thus reads the menu in Bernarr Macfadden's Penny Vital Foods restaurant in New York. The average cost of a meal is 6 cents. Macfadden says the restaurant is a combined experiment station and normal school preceding the establishment this winter of branches all over the country. Yes, whole-wheat foods are in evidence.

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PENNIES make dollars, and they netted confectionery manufacturers 26,000,000 of them last year. Penny candies amounting to 195 million pounds were sold to children in 1931, showing that the market for this type of confectionery is remarkably stable.

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ULTRA-VIOLET rays continue to do uncanny things to foods. Light of a frequency of 3,120 to 2,900 A.u. has been found to give apples just as rosy a complexion as the sun. Forty-eight hours is required for the treatment.

What Food Men Are D

More Sugar Troubles—Two Agencies Ask Lower Rates—Demands Tariffs—Hearings

SUGAR INDUSTRY activities seethed with renewed intensity in July. At Ostend, Belgium, the Chadbourne plan trembled as Cuban delegates to the international sugar conference demanded a larger contingent. When the conference adjourned, July 16, no tangible results had been obtained other than an offer which the Cuban representatives refused until the Cuban Sugar Institute could be consulted. It is understood that the terms of the offer may yet be arranged if Cuba approves them within 60 days. The proposition made to Cuba increases her 1933 export quota from 855,000 tons to 1,000,000 tons and gives her 5 per cent of Java's quota in 1934-35.

United States refiners suffered disappointment when the Tariff Commission refused an increase in the tariff differential between raw and refined Cuban sugar, which, they assert, favors Cuban refiners by 2 cents a bag. The Commission held an increase unwarranted, pointing out that the difference in cost to domestic refiners is not substantial and that Cuba refines only 5 per cent of the sugar consumed in this country.

Domestic refiners were involved in a second argument with the government at its hearing on the Sugar Institute's activities. The government has sought to show violation of anti-trust laws in the method of announcing price changes. Most of the refiners deny the charge.

Favorable news for the sugar industry is seen in the announcement that the supply available to the United States for the remainder of the year will be short by 51,000 tons.

PRICE-PEGGING proponents took it on the chin in double doses early in July when two packing control agencies bit the dust. California's Cling Peach Agency passed away after a long, brave struggle to survive. The Pacific Salmon Sales Corp. took its last breath, too, but it didn't utter a groan.

About a year ago, the peach packers tried to trim the supply by destroying orchards, and a few months later they formed a cooperative sales organization with an agreement to hold this year's pack to four million cases. But it was all of no avail.

Now, there is some talk that the collapse in prices since the fall of the agency may cause it to be dug from the grave.

PEANUT MILLS, at least certain groups of them, have engaged in activities contributing to the depression of prices to the farmer. But there is no evidence of section-wide or state-wide organizations that attempt to fix the price of farmers' stock peanuts, the Federal Trade Commission reports.

The price-depressing activities include "discussions and exchange of prices, price agreements and division of territory." Being local, "these methods do not bring the participants within federal jurisdiction." Mills in Georgia and Alabama are the ones chiefly concerned in the pricing activities.

The Commission's record shows 51 peanut milling companies, operating 102 plants, in the United States. Of these, 66 are owned by 15 companies and the remaining 36 are single-plant concerns. The peanut harvest sometimes exceeds a billion pounds, and its average value for 15 years has been almost $47,000,000.

PACKERS may soon be able to ship glass-contained foodstuffs by railway at the lower rates now applicable to foods in metal cans. At least they will if the railways have their way about it.

Asserting that trucks, which have no differential between rates on glass and metal-contained foods, are taking the business from them, railway officials have filed a petition with the Interstate Commerce Commission for further hearing on their plan to cut the rates on glass-packed foods. Schedules proposing the lower rates have previously been prepared, but they were suspended and later dismissed by the Commission.

BEVERAGE manufacturers producing or using brewer's wort and malt products, grape products or soft drinks must keep accurate and detailed records and accounts with respect to the quantity sold or used. The Bureau of Internal Revenue requires that records be maintained showing: quantity on hand at beginning of month; quantity produced; quantity purchased tax free; quantity purchased tax paid; quantity sold tax free; quantity sold subject to tax; quantity used in production of other taxable commodities; quantity used otherwise; actual wastage, evaporation and other losses; and quantity on hand at end of month.

Such records must be retained for at least four years from date tax became due, or, in case of tax-free sales, for four years from last day of month following sale. The records and books of every person liable to the tax shall always be open to government inspection.

MORE BARRIERS to foodstuffs from the United States have been set up by European countries. France increased the maximum duty on raw hams, salted or

Doing and Saying

Pass Out—Accuse Peanut Millers—Tax Records—New Foreign Scheduled—Crops

in brine, from 260 to 800 francs per 100 net kilos, effective July 8. Germany raised the import duty on bacon from 14 to 20 Reichsmarks and that on lard from 6 to 10 Reichsmarks per 100 kilos, effective July 5. Norway boosted the import duty on prunes from 0.27 to 0.45 crown per net kilo and that on "unspecified dried fruits and berries," including dried apples but not raisins, currants, dates or figs, from 0.72 to 1.08 crowns per net kilo, effective July 2. And Turkey has passed a law authorizing the establishment of import monopolies on sugar, tea and coffee, effective about Oct. 1.

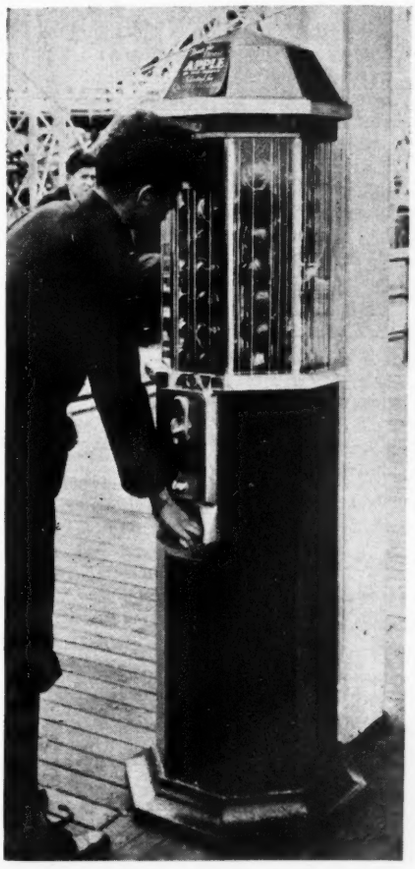
INVESTIGATIONS into the differences in cost of production of crab meat, canned clams and fish packed in oil have been ordered by the Tariff Commission. Public hearings in connection with the investigations will be held at the office of the Commission in Washington, D. C., on the following dates: crab meat, Oct. 4; clams, Oct. 5; fish, Oct. 6.

CORN promises to give wheat and sugar a little competition for the questionable honor of being a crop with a heavy surplus. Based on July 1 conditions, the maize production this year is put at 2,995,850,000 bu., or over four hundred million bushels more than last year. Aided by weather that has been better than normal, other grain crops are expected to be larger than in 1931, except for winter wheat. The estimates are as follows: durum wheat, 54,754,000 bu., against 18,000,000 harvested last year; other spring wheat, 250,464,000, against 86,000,000; winter wheat, 431,762,000, against 787,000,000; all wheat, 736,971,000, against 892,000,000; oats, 1,217,244,000, against 1,112,000,000; barley, 312,000,000, against 199,000,000; and rye, 44,300,000, against 32,700,000. However, rice is estimated at only 38,000,000 bu., compared to 45,000,000 last year; and Japan's rice stocks are only 32,877,975 koku, as against 36,039,927 last year (1 koku = 5.12 bu.).

Except for grapes, the fruit estimates for 1932 are smaller. Peaches are placed at 47,200,000 bu., or about 38 per cent less than in 1931. Apple production, likewise, will be 34 per cent less, or 133,824,000 bu. Indicated pear production is 21,500,000 bu., a decline of 8 per cent. But the grape crop is put 32 per cent larger, or at 2,140,000 crates.

Potato production will be slightly larger, being put at 378,000,000 bu., against 376,000,000 bu. last year. There will be considerably more sweet potatoes, or 80,300,000 bu., against 62,900,000 last year. The brewers' hop supply has not fared so well, being 23,600,000 lb., compared to 25,900,000 in 1931.

Sugar beet acreage in this country and Europe, including Russia, shows an increase of 5.6 per cent over that harvested last year. Excluding Russia, a decrease of 6.2 per cent is expected. And, in the United States, the supply of beet sugar on hand July 1 was about 125,000 tons less than a year ago.



Put a nickel in the slot, twist the knob any you have a nice, rosy apple grown in the state of Washington—yes, it's transparent wrapped. This vender serves New Yorkers who go for a stroll along Coney Island's famous Boardwalk. Although just introduced into New York, the machines are in 22 cities from coast to coast. The apples are kept in cold storage, and fresh ones are put into the machines daily.

From the Northwest comes a report that the red salmon pack from the Alaska district is to be 2,000,000 cases this season. The pack of canned oysters for the United States during the season ended June 30 is 49 per cent higher than last year, or 397,516 standard cases of 48 No. 1 (5-oz.) cans.

IT SEEMS—

An international event of great importance took place when Congress adjourned. This removed from the situation the danger of unsound, inflationary legislation.

With their new authority to make direct loans, Federal Reserve Banks are in a position to break the credit jam. There is reason to believe that the new powers will be directed immediately to that end.

A more liberal policy on the part of the Reconstruction Finance Corp. is expected with the retirement of Eugene Meyer as its president. This is hailed by some as ushering in an era of greater effectiveness for the corporation.

PAUL WOOTON,
Washington Correspondent.

Concentrates

Tokio predicts that Japanese exports of white tuna, most of which comes to the United States, will treble last year's record of 28,000 cases . . . Russia is building a large dairy combine at Leningrad with a daily capacity of 400 tons of butter, cream, and cheese . . . Skyrocket growth of the British canning industry is seen in quadrupling of can production in two years by Metal Box Co., Ltd., producer of 90 per cent of Britain's tin food containers . . . Madagascar exported 22 per cent more vanilla beans last year than in 1930, 796,893 kilos being shipped . . . Fifteen per cent of industrial accidents are caused by poor lighting, Department of Labor surveys indicate . . . The efficient cleaner for cars used to haul flour is compressed air applied at a pressure of 90-lb. per sq.in., a Pillsbury official states . . . Regulating the heating of cars of fruits and vegetables on the basis of inside, rather than outside, temperature reduces heating time by 30 to 40 per cent, Bureau of Plant Industry states . . . New York State Agricultural Experiment Station finds that arsenic residue is best removed from fruit by washing with solution of 1 to 3 per cent hydrochloric acid . . . Retail food prices on June 15 were only 0.1 per cent above the level of 1913 . . . Forty-five per cent of the wholesale business of the United States is done by farm, food and grocery trades . . . Ten years ago, fresh milk was an imported luxury in Cuba. Now 320,723 liters is produced there daliy . . . Sugar shortage in Russia has caused the closing of several Soviet candy factories, it is reported . . . Packing of oleomargarine in tin containers, now prohibited, is contemplated in a bill adopted by the Senate July 11 . . . A larger poultry supply this fall and winter is indicated by a 7.5 per cent increase in number of chickens . . . Egg production is not expected to exceed that of last year, and cold-storage stocks of eggs are 28 per cent less. . . . The 1932 catch of mackerel by seine and net fisheries in the United States is put at 26,000,000 lb. . . . Packer's wage rates dropped 25 per cent in San Joaquin Valley.

BUSINESS TRENDS

Hog Prices Make Big Gain; Number of Pigs Drops

After falling to the lowest levels in 35 years during the three weeks ending June 12, when the low top price at Chicago was $3.35, hog prices advanced throughout the four weeks ending July 9 to a top of $5.50, the highest since last October. Omaha saw an even greater price rise, the low there being $2.90 on June 8 and the high $8.10 on June 30.

Reduction of supplies by 45 per cent during June, the largest curtailment on record, brought the upturn in prices. This resulted from a shortage of hogs in Minnesota, western Iowa, the Dakotas and Nebraska. Another factor contributing to the climb was an increase in consumption due to moderate temperatures in late June and early July.

Supplies a few months hence may be somewhat reduced, since the number of young pigs as of June 1 is estimated to be 10 per cent lower for the corn belt and 7 per cent lower for the whole United States than at the same date last year. Missouri and Kansas, however, have respectively, 7 and 5 per cent more pigs than last year, and these states also report heavy corn crops.

Foods Hold Up Well

Freight car requirements for all commodities will be down 21.1 per cent for the third quarter of the year, the American Railway Association forecasts. However, much smaller declines are indicated for four manufactured-food groups, as follows: mill products, 5.2 per cent; poultry and dairy products, 5.7; canned goods, 7.5; sugar, syrup and molasses, 12.1

Business Brightens

Continued rise in commodity prices supported by ready market absorption of new refunding bond issues and adjournment of Congress without any last-minute damaging legislation gives business a more cheery aspect than is usual for midsummer.

The Business Week index of general business conditions for the week of July 16 continues to hold at the level of 55.5 per cent of normal, as reported for the week ending June 18.

Wholesale prices of all commodities, as reported by the U. S. Department of Labor, have increased 1.56 per cent for the four-week period ending July 16. Food prices rose 4.61 per cent. After a steady increase to the week ending July 16, a weighted price index gives net decreases of 0.88 per cent on all commodities and 3.43 per cent on food prices for the week ending July 23, as compared with those of the week ending June 25.

Higher prices, home gardens, and unusually low prices on garden truck at roadside stands have reduced tonnage sales in retail grocery stores. A. & P. tonnage sales for June were 4.06 per cent below those for June, 1931.

Basis for the Curves

Retail food prices, factory employment, factory payrolls and wholesale prices are based on indexes of the Department of Labor. Cost-of-living index is that of the National Industrial Conference Board. Electrical power consumption figures are furnished by *Electrical World*.

Corn Products Down 41.1%, 1931 Census Shows

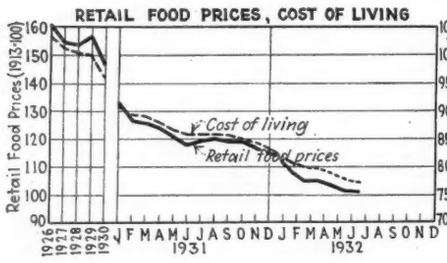
Decreases amounting to 41.1, 22.1 and 17.6 per cent, respectively, in value of manufactures in the corn-products, cane-sugar and leavening-compound industries are shown by comparison of the Census of Manufactures for 1931 with that for 1929. The value of corn syrup, corn sugar, corn oil, corn starch and related products was only $97,695,478 last year. Establishments in the industry numbered 42, or 7 more than in 1929, but wage earners and wages were 2.2 and 20.3 per cent less, respectively. Most of the curtailment in the use of corn products, it is generally believed, occurred in industry rather than in human consumption. Competition by imported corn starches and tapioca flour intensified curtailment.

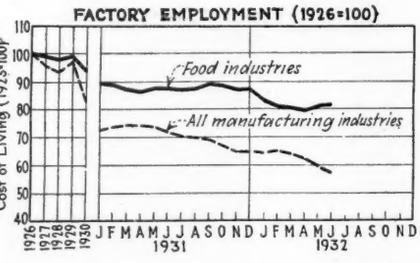
In the cane-sugar industry, 1931 manufactures were valued at $395,302,939. Nineteen establishments, or two less than in 1929, were operating but were employing 15.7 per cent less wage earners.

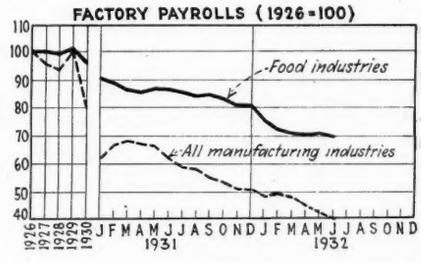
Baking powders, yeast and other leavening agents produced in 1931 were valued at $43,137,665. The number of establishments decreased by 7 from 1929 to 1931; the number of wage earners declined 10.5 per cent.

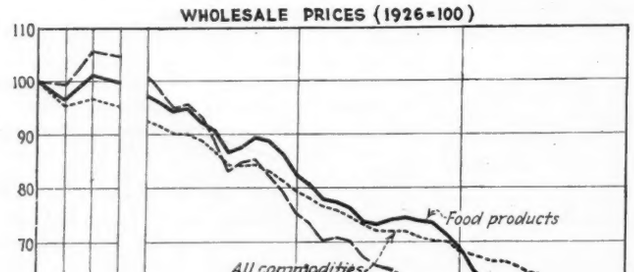
Check Tax Avoidable

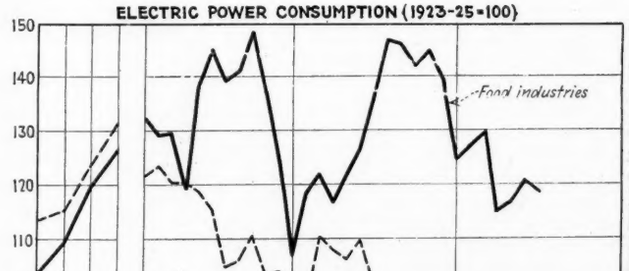
Dealers making numerous small payments, such as those to farmers for cream and eggs, may avoid the 2c. tax on checks on such payments. This is done by using forms that are simply orders to pay and are not orders drawn upon a bank. The bank at which they are payable, however, is indicated at the bottom.


RETAIL FOOD PRICES, COST OF LIVING
Retail Food Prices (1913=100)
Cost of Living (1923=100)
Cost of living
Retail food prices
1926 1927 1928 1929 1930 1931 1932







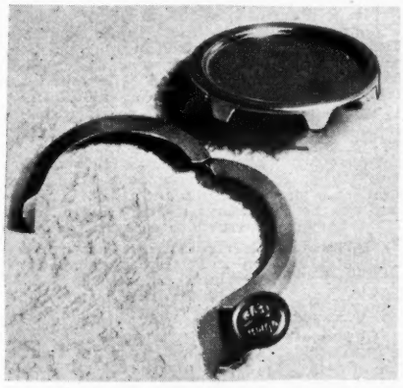


NEW EQUIPMENT FOR FOOD MANUFACTURERS

Seal Opens Easily; Serves As Reclosure Cap

Provisions for easier opening and for use as a reclosure are incorporated in the design of a new Goldy seal announced by the Aluminum Seal Co., New Kensington, Pa.

The seal is basically the same as its predecessor, being made up of a lined inner disk held firmly in place by an aluminum capsule. However, a notch in the capsule at a point opposite the tear-off tab conveniently serves as a hinge in the ring; and notches on each side of the tab make it easier to break the seal. An inner

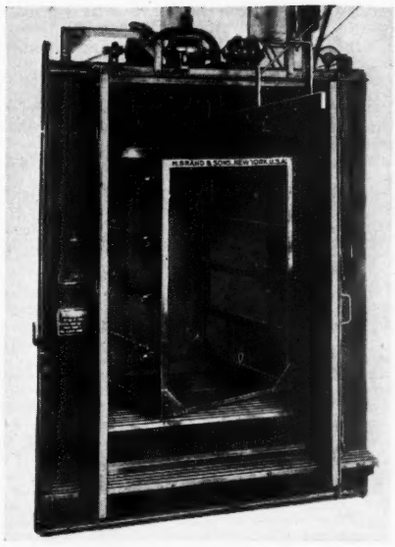


disk with lugs on the flange that make it a handy "snap-on" cap after the capsule has been removed is optional, as is a latex sealing ring.

Used for a variety of bottled products, the new closure is said to be particularly adapted to sealing those which tend to crystallize, such as honey, maple and malt syrups, flavoring extracts, and fruit juices.

Rotary-Track Smokehouse Reduces Shrinkage

Reduction in shrinkage, together with uniform smoking and substantial savings in fuel, sawdust, labor, and time, is made possible by a rotary-track smokehouse manufactured by M. Brand & Sons, Inc., New York, N. Y., according to the manufacturers. The Brand smokehouse is made of insulated steel and is sectional, so that it may be taken apart and moved. The products are placed on a cage which is rotated by a small motor, mounted on the top of the smokehouse, so as to subject each piece of meat to the same conditions of smoke and temperature. Automatic starting and stopping devices, an extra heavy track-locking mechanism and a sensitive chain clutch are incorporated in the de-



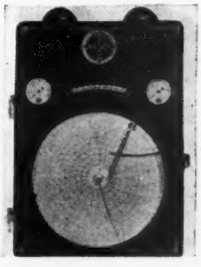
sign of the smokehouse to make it foolproof and safe.

The outside dimensions of a smokehouse of this type are 6 ft. 8 in. x 6 ft. 8 in., and its capacity, with a standard fire pit, ranges from 2,500 to 3,000 lb. of heavy smoked goods for an 8- to 10-hr. day. It requires a maximum headroom of 12 ft. and an open space in front of 8 ft. The unit weighs 5,000 lb.

Single-cage and multiple units are available. They can be made to hold from 1 to 4 or 8 cages at one time. Any kind of fuel, such as wood, gas or sawdust, may be used.

Gas-Pressure Controllers Readily Synchronized

Instant synchronization with the speed of the process and a straight-line relation between the operation of the control element and the control valve are attributed to the pressure controllers announced by the Mason Regulator Co., 1190 Adams St., Boston, Mass. Synchronization with the process is made possible by the patented Mason Rota-Port synchronizer which enables the control valve to be shifted to any one of five flow rates by merely rotating a disk.



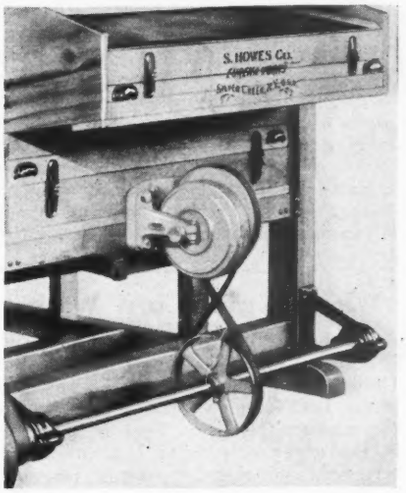
The vital part of the instrument is a compound pilot valve which has the ability to furnish a constantly increasing or decreasing pressure or to maintain a static pressure in the diaphragm of the control valve. The dual valves of this pilot valve make it self-compensating and permit the control valve to be installed at any distance from the instrument.

Recording and non-recording pressure controllers are available; the former being shown in the illustration.

Separator Drive Eliminates Vibration of Eccentric

Vibration set up in separators by eccentric drives and the resulting wear and loosening of the machine are eliminated by the Eureka-Buhler drive manufactured by the S. Howes Co., Inc., Silver Creek, N. Y.

Essentially, this drive is a mechanism for converting rotary motion into reciprocating motion by the action of inertia. It comprises a set of oppositely

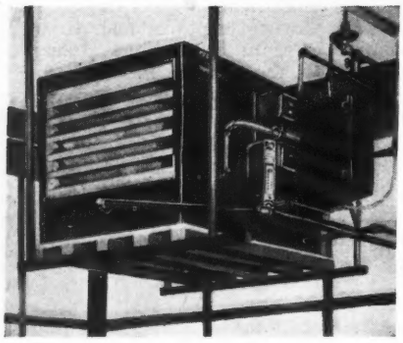


counterweighted wheels so geared as to rotate in synchronism in opposite directions. The rotors are offset axially and are supported by stands bolted to a vertical baseplate. The unit is attached to the shaker to be reciprocated and is operated by a belt drive. During two periods of each revolution, the counterweight of one wheel neutralizes that of the other, resulting in no motion. At 90 deg. from each of the neutral periods the counterweights act together to produce the to-and-fro motion. The illustration shows the drive attached to a grain-cleaning separator.

Vapor Humidifier Employs Few Operating Parts

No spray heads, compressors or air lines are employed in the new automatic Harris humidifier announced by the Industrial Dryer Corp., Stamford, Conn. It moistens the air with vapor generated by steam or electrical heat and produces circulation by a fan driven by a 1/6-hp. electric motor. By a patented device, the temperature of the air is kept substantially the same during humidification.

The unit is 2½ ft. square and 6 ft. long. It delivers 800 cu.ft. of air per minute, handling a room of 30,000 to 40,000 cu.ft. capacity. It maintains any desired relative humidity and cuts off when the desired degree of saturation is reached.



A thermostat maintains the proper operating temperature.

Since the moisture is introduced into the air in vapor instead of in liquid form, as it is with spray humidifiers, there are no descending particles of water to dampen the floors or goods in the room. And since the machine does not saturate the air, condensation does not take place.

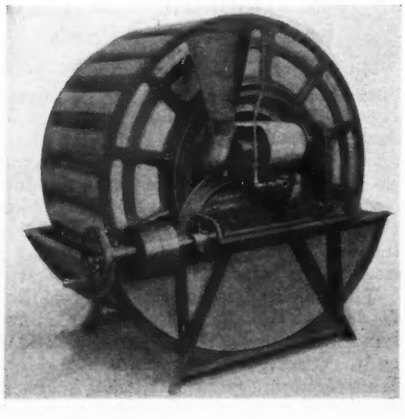
In the food industry, the machine will find application in the flour storage rooms, fermentation rooms, and proof boxes of bakeries; in the malt rooms of beverage plants; in fruit and vegetable rooms of canneries; in the ripening of bananas and oranges; in the cooling and storage rooms of meat packing plants; in sausage manufacture; and in macaroni drying.

Whole Grain Corn Washer

Economy in use of water and floor space is featured in the Tuc corn washer of the United Co., Westminster, Md., exhibited at the 1932 Canners' Show. Corn fed into the washer from two lines is submerged in the water only from 7 to 10 seconds, screened, and rinsed before it leaves the machine.

Riddle-like construction of the rotating drum traps the corn—kernels of the young corn as well as those of the mature—in the depressed sections, leaving the chaff and cob tissues to float away on the surface of the wash water. When the drum has rotated to the point where the corn-containing pockets are in an inverted position the corn drops out onto a belt conveyor which discharges the corn from the washer.

This riddle-like type of construction of the washer and the relatively small volume of water in the washer at one time facilitates quick and complete removal of the corn and makes fermentation and bacterial action less likely.



THE MANUFACTURERS OFFER

Graphic Meters—An 80-page catalog illustrating and describing in detail instruments recently placed on the market by Esterline-Angus Co., Indianapolis, Ind., is announced.

Fibre Ware—Illustrations and specifications of the line of fiber pails, trays, measures, funnels, and receptacles made by Almo Trading & Importing Co., Inc., 61 East 11th St., New York, N. Y., comprise the subject matter of a 10-page catalog of the company.

Handling Materials by Air—Sixteen pages of a booklet issued by Raymond Bros. Impact Pulverizer Co., 1315 North Branch St., Chicago, Ill., are devoted to the story of the Raymond system of separating, drying, conveying and dust-collecting in industrial plants.

Mold and Rope—Information on the character of mold and rope, where and why they develop, and what can be done to prevent them comprises the subject matter of a 16-page, well illustrated booklet of Mathieson Alkali Works, 250 Park Ave., New York, N. Y. The publication also treats of the use of hypochlorite as a cleansing and disinfecting agent in bakeries.

Sealing Caps—In an artistically illustrated 32-page booklet, Crown Cork & Seal Co., Baltimore, Md., describes the growth of the glass package idea, the importance of closures, peculiar sealing problems of the glass finish, requirements of a good cap for sealing glass packages, and the design and advantages of the new crown screw cap.

Colloid Mills—Chemicolloid Laboratories, Inc., 44 Whitehall St., New York, N. Y., describes, illustrates and gives specifications of its colloid mills in a 12-page booklet.

Strainers — A 4-page folder leaflet of Fisher Governor Co., 201 South First Ave., Marshalltown, Iowa, gives the mechanical principles and advantages of the company's self-cleaning Y-type strainer for steam, air, water, oil, and gas.

Air Filters—Industrial dust problems and a number of applications for air filters, among which is the control of bacteria and mold spores, comprise the subject matter of a 26-page, well-illustrated booklet of American Air Filter Co., Inc., Louisville, Ky.

Exhaust Fans—Twelve pages are given to the mechanical principles, blueprint specifications, and capacity tables for the exhaust fans manufactured by Duriron Co., Inc., Dayton, Ohio, in a bulletin offered by the company.

Chromium-Nickel Alloy — Technical information, including tables and charts, comprises the subject matter of a 12-page bulletin of International Nickel Co., Inc., 67 Wall St., New York, N. Y. The publication deals with the resistance of pure nickel and Inco chrome nickel to corrosion by milk.

Spray Dryers—Peebles spray drying system of Western Precipitation Co., 1016 West 9th St., Los Angeles, Calif., is described and illustrated in an 8-page pamphlet of the company.

Chemicals—Wholesale price lists of essential oils and other chemical preparations for adding aroma and flavor to manufactured products are given in a 16-page publication of Fritzsche Bros., Inc., 78 Beekman St., New York, N. Y.

Caps—The advantages and charactristics of the Anchor Amerseal cap, metal box and can nozzle are given in an illustrated 20-page booklet of Anchor Cap & Closure Corp., 22 Queens St., Long Island City, N. Y. The service of the company is also described.

Unit Heaters—In a 20-page, loose-leaf booklet, Bishop & Babcock Sales Co., 4901-15 Hamilton Ave., Cleveland, Ohio, describes and illustrates its floor and ceiling steam unit heaters, giving specifications, operating data and wiring diagrams for the control system.

Refrigeration Equipment — In a folder leaflet, "Ice & Frost," Frick Co., Waynesboro, Pa., describes and illustrates several industrial applications of refrigerating equipment.

Cellophane Packaging — How sales are stimulated by Cellophane containers and the mechanical features and advantages of the packaging machine manufactured by Automat Molding & Folding Co., Toledo, Ohio, constitute the text of two 4-page folders of the company.

Frozen-Products Cases — In an 8-page booklet, McCray Refrigerator Sales Corp., Kendallville, Ind., describes, illustrates and gives specifications for its line of cases for frozen products.

Ventilating Fans — Construction details, advantages, capacity, dimensions, prices and typical installations represent the subject matter of an 8-page illustrated bulletin of L. J. Wing Manufacturing Co., 154 West 14th St., New York, N. Y.

Flake Ice—The nature of FlakIce, the methods of handling and storing the product, its applications and the machinery employed in its production are dealt with in two bulletins, "FlakIce—New Developments," and "Machines Producing FlakIce," issued by FlakIce Corp. of New York, 205 Water St., Brooklyn, N. Y.

Citrus Pectin—California Fruit Growers' Exchange, Ontario, Calif., gives the history and development of Exchange citrus pectin and the advantages of its use in the manufacture of confections and jellies in an attractively illustrated 12-page booklet.

Motors, Compressors, Switches — Two loose-leaf pamphlets, GEA-1542 and GEA-1344A, issued by General Electric Co., Schenectady, N. Y., respectively describe the Type B, general-purpose d.-c. motor and the single-stage centrifugal compressor of the company. A third publication, GEA-1568, is devoted to magnetic switches.

Mechanical Refrigerators—How mechanical refrigeration aids the meat market to increase its sales and cut its costs is the subject of a 14-page illustrated booklet of York Ice Machinery Corp., York, Pa.

Chemicals—Prices of the rare sugars, amino acids, laboratory reagents and biochemicals manufactured by Pfanstiehl Chemical Co., Waukegan, Ill., are listed in a 24-page booklet.

Filters—Construction and operating principles of the Cuno metal-disk filters for liquids are explained in a 24-page booklet of the Cuno Engineering Corp., Meriden, Conn.

Screw Capper — In an illustrated folder leaflet, Pneumatic Scale Corp., Ltd., Norfolk Downs (Quincy), Mass., presents the advantages of its automatic feed machine which is said to eliminate the use of a tool in removing the caps.

Refractometers — A discussion of refractive index and a description of the Abbe and Dipping refractometer manufactured by Bausch & Lomb Optical Co., Rochester, N. Y., are the subjects dealt with in an 18-page booklet.

Automatic Control Devices—A series of loose-leaf bulletins devoted to the different types of valves manufactured by Alco Valve Co., Inc., 2628 Big Bend Blvd., St. Louis, Mo., describes and illustrates the company's line of valves for refrigerating, heating and other industrial systems.

Ice Cream Cabinets — Anheuser-Busch, Inc., St. Louis, Mo., discusses, illustrates and gives specifications for its mechanical ice cream cabinets in an 8-page folder leaflet.

Strapping Machine—In a 4-page folder leaflet, Signode Steel Strapping Co., 2616 North Western Ave., Chicago, Ill., presents the mechanical features and advantages of its new steel-strapping machine.

Vacuum Fumigating and Sterilizing—Discussion of vacuum fumigation vs. atmospheric fumigation is given in the 8-page booklet illustrating uses for equipment manufactured by the F. J. Stokes Machine Co., Olney P. O., Philadelphia, Pa.

Flexible Couplings — Morse Chain Co., Ithaca, N. Y., in a 24-page booklet, illustrates, describes, and lists specification on Morse flexible couplings. Known as Bulletin No. 47.

CONSTRUCTION NEWS

PROPOSED WORK BIDS ASKED

Bakery — W. Butler, Richardsville, N. B., plans to build bakery here and will require complete equipment. Estimated cost $25,000.

Bakery—Joseph Minardi, 121 East 22nd St., Paterson, N. J., will soon award contract for altering and building 1 story addition to bakery on Grand St. Separate bids will be taken for machinery. Estimated cost $28,500.

Bakery—Oregon Bakery Products Co., 455 East Davis St., Portland, Ore., will build new plant and operate same under name of Dixie Bakery Co. New machinery will be required. Estimated cost $75,000 to $100,000.

Bakery—H. H. Peters, Pocahontas, Ark., will rebuild bakery recently damaged by fire. City Bakery lessee. Estimated cost $25,000 to $30,000.

Bakery—The Rose Co., c/o Garfield Baking Co., 152 Hope Ave., Garfield, N. J., is receiving bids for a 2 story, 65x100 ft. bakery and garage at Passaic, N. J. Estimated cost $40,000.

Bottling Plant—Carrollton Coca Cola Co., Carrollton, Ark., plans to rebuild bottling plant. Estimated cost $30,000.

Bottling Plant—Hoffman Beverage Co., 402 Grove St., Newark, N. J., plans to construct addition to plant on South 21st St. Estimated cost $40,000. Private plans.

Brewery—C. H. Cope, Russ Bldg., San Francisco, Calif., plans to reconstruct brewery at San Jose, Calif. Estimated cost exclusive of equipment $40,000.

Canning Plant — Ward Moulton, Phoenix, N. Y., plans to build a canning and sauerkraut plant at Clay, N. Y. Estimated cost to exceed $25,000. Maturity indefinite.

Canning Plant, etc.—Union Socialist Soviet Republics, c/o Amtorg Trading Corp., 261 5th Ave., New York, N. Y., is having plans prepared for canning plant, 2 fruit and vegetable drying factories, tomato paste unit, and pickle works, also starch manufacturing plant from potato by-products, in vicinity of Varonezh (Central Black Soil Region) Russia. A fruit juice packing plant with sterilization equipment is contemplated later.

Cannery—Dalton J. V. Snyder, Archt., 3125 Union Guardian Bldg., Detroit, Mich., will soon award contract for cannery in vicinity of Detroit, to include dairy barns, etc. Owner's name and exact location withheld. Estimated cost $75,000.

Candy Factory — Westfield Candy Kitchen, Inc., 171 East Broad St., Westfield, N. J., is receiving bids for a 2 story factory on Broad St. Estimated cost $28,500. William Wilde, 401 South Ave., Westfield, is architect.

Factory—Best Foods Manufacturing Co., 1900 Bryant St., San Francisco, Calif., plans to construct factory and office building. Estimated cost $100,000.

Creamery—Fairmont Creamery Co., Council Grove, Kan., plans to rebuild creamery recently destroyed by fire. Estimated cost $50,000. Maturity indefinite.

Dairy Farms Buildings—Genesee Farms, Inc., Bethany, N. Y., plans to rebuild dairy buildings on Telephone Rd. recently destroyed by fire.

Dairy Products Plant — Texas Technological College, c/o C. B. Jones, Chairman, Spur, Tex., plans to build a 1 and 2 story dairy products plant at Lubbock, Tex., to include equipment for the manufacture of various dairy commodities. Estimated cost $35,000.

Ice Cream Plant — Navilla Ice Cream Company Ltd., Niagara Falls, Ont., plans construction of an ice cream manufacturing plant. Estimated cost $25,000.

Bean Grading and Curing Plant — G. E. Stevens, Edinburg, Tex., plans to build a 2 story bean grading and curing plant here. Private plans.

Feed Mill — Johnson & Beattie Feed Co., Plainwell, Mich., plans to build a plant here. Estimated cost to exceed $50,000.

Flour Mill—Commander-Larabee Corp., 661 New Chamber of Commerce, Minneapolis, Minn., has acquired plant of G. V. R. Smith Milling Co., Sherman, Tex., and plans to enlarge same and install new equipment. Estimated cost $40,000.

Flour Mill — Eesley Milling Co., Plainwell, Mich., plans to build mill here. Estimated cost to exceed $40,000.

Flour Mill—Horton Milling Co., Greenville, Tex., plans to rebuild flour mill recently destroyed by fire. Maturity indefinite.

Flour Mill — J. MacAlary, Frankford, Ont., plans to construct a flour mill here. Estimated cost $30,000.

Mill and Warehouse — Las Vegas Land & Water Co., Pacific Electric Bldg., Los Angeles, Calif., will soon award the contract for a 2 story mill and 1 story warehouse at Pomona, Calif., for the Pomona Grain & Milling Co., 695 East 1st St. Estimated cost to exceed $28,500.

Grain Elevator—Standard Elevator Co., Tako, Sask., plans construction of a grain elevator. Estimated cost $50,000.

Grain Elevator—Vancouver Harbor Commission, W. D. Harvie, Secy., Foot of Dunlevy St., Vancouver, B. C., will soon receive bids for superstructure for addition to Grain Elevator No. 1, to have capacity of 475,000 bu. H. W. Frith, Ch. Engr. Commission. John S. Metcalfe Co., Ltd., 837 Hastings St., Vancouver, is engineer.

Cold Storage Warehouse—Meaford Co-operative Fruit Growers Association, Meaford, Ont., is receiving bids for the construction of a 2 story, 40x80 ft. warehouse and is interested in prices of complete equipment. C. Running, Clarksburg, Ont., is president.

Cold Storage and Packing Plant—Forest Fruit Growers Association, C. A. Smith, Secy., Forest, Ont., plans to construct a cold storage and packing plant. Company is interested in prices of complete equipment. Estimated cost $30,000.

Refrigeration Plant—M. C. Provision Co., 414 Hoboken Ave., Jersey City, N. J., had plans prepared for altering plant on Hoboken Ave. Bids for work will be taken about Aug. 22. Estimated cost $28,500. Construction Service Corp., 80 Broad St., Elizabeth, is architect.

Ice Plant—W. P. Hill, Ardmore, Okla., plans to build a 20 ton raw water ice plant at Durant, Okla. Estimated cost $30,000.

Packing Plant — Sunflower Packing Corp., Porterville, Calif., is rebuilding plant destroyed by fire. New plant will be 1 story, 100 x 220 ft. Estimated cost $40,000. Harry T. Honn, 1139 North Alameda St., Los Angeles, is architect and engineer.

Packing Plant — Swift & Co., Union Stock Yards, Chicago, Ill., is receiving bids for 76 x 200 ft. addition to plant at Water and Railway Sts., Spencer, Ia. Estimated cost $40,000. Private plans.

Grocery Warehouse — National Grocers, Ltd., Niagara Falls, Ont., plans to contruct warehouse. Estimated cost $50,000.

Meat Market, etc.—City of New Orleans, c/o Mayor, New Orleans, La., plans to contruct meat market, farmers market and fish market on Decatur St. Estimated cost $60,000, $120,000 and $45,000 respectively. Sam Stone, Jr., Masonic Temple Bldg., New Orleans, is architect.

Poultry Supplies—Supto Manufacturing Co., 806 S. E. Raccoon St., Des Moines, Iowa, plans to build a plant for the manufacture of poultry supplies. Estimated cost to exceed $25,000.

Stockyards — Nampa Union Stockyards, Nampa, Idaho, plans to construct complete stockyards. Estimated cost $200,000. Weller Robinson is director.

CONTRACTS AWARDED

Bakery — Davidson Biscuit Co., Mt. Vernon, Ill., will build a 4 story, 51 x 100 ft. bakery. Work will be done by day labor and sub-contract basis under supervision of W. N. Atkinson, Mt. Vernon.

Bakery—William Freihofer Baking Co., 20th St. and Indiana Ave., Philadelphia, Pa., awarded contract for rebuilding bakery on Union Blvd. and Quebec St., Allentown, Pa., recently destroyed by fire, to George H. Hardner, Lentz Bldg., Allentown. New plant will have capacity of 8,000 loaves of bread per hour. Estimated cost $1,000,000.

Bakery — Gertmans Bakery, 231 James St., Akron, Pa., awarded contract for 1 story, 41 x 100 ft. bakery at Latrobe, Pa., to Annibale Lorio, 219 Lloyd Ave., Latrobe, Pa.

Bakery—Joseph Minarchi, 121 East 22nd St., Paterson, N. J., awarded contract for altering and building 1 story addition to bakery on Grand St., to Ralph DiBrino, Mill St., Paterson, N. J. Estimated cost $28,500.

Bakery — Trustees State Training School, Hartford, Conn., awarded contract for bakery addition to school at Mansfield, Conn., to Charles Smith & Sons, 101 Water St., Derby, Conn. Estimated cost $21,000.

Dairy—I. Weissglass, 2014 Forest Ave., Elm Park, S. I., N. Y., awarded contract for 1 story dairy at Mariners Harbor, N. Y., to I. V. Pederson, 89 Grand Ave., Port Richmond, N. Y. Estimated cost $28,500.

Dairy—Gehl Dairy Co., 1404 West Fond du Lac St., Milwaukee, Wis., awarded contract for 2 story, 60 x 152 ft. dairy building on West Capitol St., to Bryne Bros., 3100 West Burleigh St., Milwaukee, Wis.

Dairy—Pure Milk Co., 181 John St., Hamilton, Ont., awarded contract for 2 story addition to plant to Tope Construction Co., 945 Main St. W., Hamilton. Estimated cost $80,000.

Milk Distributing Plant—Dairy Delivery Co., 2550 19th St., San Francisco, Calif., awarded contract for distributing plant on Potrero Ave., to H. H. Larsen Co., 64 South Park St. Estimated cost $91,500.

Grocery Warehouse—Economy Grocery Stores, Inc., 205 A St., South Boston, Mass., awarded contract for 1 story, 140 x 180 ft. warehouse addition at 401 D St., to Julius J. Conviser, 333 Washington St., Boston, Mass. Estimated cost to exceed $28,500.

Cold Storage Plant—Grace Bros., Santa Rosa, Calif., awarded contract for cold storage plant at 9th and Wilson Sts., Santa Rosa, to Western Iron Works, 141 Beale St., San Francisco. Estimated cost exceeds $75,000.

Cold Storage and Packing Plant — Kaledon Cooperative Association, Penticton, B. C., awarded contract for a 2 story, 50 x 100 ft. cold storage and packing plant to J. Sinclair, Penticton. Estimated cost $50,000.

Packing Plant—Adolph Gobel, Inc., 40th St. and 11th Ave., New York, plans to alter two 4 story packing plants at Morgan Ave. and Rock St., Brooklyn, N. Y. Work will be done by day labor and separate contracts. O. S. Schlich, 136 Liberty St., New York, is engineer and architect.

Packing Plant—John Morell & Co., Ottumwa, Iowa, awarded contract for the construction of a 2 story, 76 x 180 ft. meat packing plant at Kent Ave. and 10th St., Brooklyn, N. Y., to Turner Construction Co., Graybar Bldg., New York. Estimated cost $150,000.

Grain Elevator and Warehouse—Cargill Grain Co., 141 West Jackson Blvd., Chicago, Ill., awarded contract for grain elevator and warehouse at 123rd St. and Calumet River, to James Stewart Corp., 343 South Dearborn St., Chicago. Estimated cost $1,000,000. First unit of one bin capacity, 1,500,000 bu., total capacity of all units 16,000,000 bu.

Grain Elevator — Mound Ridge Milling Co., Mound Ridge, Kan., awarded contract for 100,000 bu. capacity elevator to Chalmers & Borton, 620 Pioneer Trust Bldg., Kansas City, Mo.

Ice Factory — Crystal Ice Factory, c/o A. Kifuri, Eagle Pass, Tex., will build a 1 story, 60 x 90 ft. ice factory by day labor.

Refrigerating Plant—H. Deile & Co., 84 Jackson St., Hoboken, N. J., awarded contract for plant to C. V. Daniels & Co., 449 West 28th St., New York, N. Y. Estimated cost $29,000.

Cheese Factory—Kraft-Phenix Cheese Corp. of California, 950 Battery St., San Francisco, Calif., awarded contract for a 3 story concrete addition to factory to Cahill Bros., 206 Sansome St., San Francisco. Estimated cost $35,000.

Pickle Factory—Harvard Pickle Works, 172 Thorndike St., Cambridge, Mass., will build a 2 story pickle factory on Harvard St. Work will be done by separate contracts.

Macaroni Factory—Kentucky Macaroni Co., 2501 South Floyd St., Louisville, Ky., awarded contract for a 1 story, 150 x 210 ft. L shape factory building on Floyd St., to J. B. Jenkins, 2501 South Floyd St. Estimated cost $38,000.

Stock Yards, etc.—Missouri, Kansas & Texas R.R., F. Ringer, Chief Engr., Railway Exchange Bldg., St. Louis, Mo., awarded contract for stock yards on Lincoln Ave., Parsons, Kan., to include hog house and cattle pens, to D. R. Campbell, Parsons, Kan.

PATENT DIGEST

Baking and Milling

Flour Duster in Combination With Dough Molding Machine—Edward T. Parsons, Upper Montclair, N. J., to Thompson Machine Co., Belleville, N. J. No. 1,856,585. May 3, 1932.

Baking Powder Containing Acetone Dicarboxylic Acid—Edwin O. Wilg to Wisconsin Alumni Research Foundation, Madison, Wis. No. 1,856,938. May 3, 1932.

Reciprocating Plunger-Type Depositing Machine for Dough and Similar Materials—Robert Martin Chambers to George Martin and Theresa Martin, Belfast, Ireland. No. 1,857,622. May 10, 1932.

Dough Dividing Machine With Double-Space Piston Whose Faces Form Bottoms of Variable Dough-Measuring Pockets—Jack Vikruss Mason, Cheadle Hulme, Cheshire, England. No. 1,857,927. May 10, 1932.

Yeast Grown in Solution Containing Carbohydrates, Urea and Non-Ammoniacal Inorganic Nutrient Salts—Albert K. Epstein, Chicago, Ill. No. 1,858,488. May 17, 1932.

Automatic Dough Dividing and Working Machine—Otto Kremmling, Hamersleben, Germany. No. 1,858,831. May 17, 1932.

Traveling Oven of Tier Type—John Edward Pointon, Peterborough England, to Baker Perkins Co., Inc., New York, N. Y. No. 1,858,937. May 17, 1932.

Dry Yeast Made by Mixing Yeast With Readily Soluble Calcium Salts of Lactic Acid and Drying Mass—Rudolf Bertel, Vienna, Austria. No. 1,859,250. May 17, 1932.

Bread-Slicing Machine With Parallel Upper and Lower Shafts for Driving Endless Slicing Bands—Harry J. Criner and Harry E. Criner, one-half to A. G. Bush, Davenport, Iowa. No. 1,855,706. April 26, 1932.

Doughnuts Treated to Prevent Absorption of Grease by Sugar Coating — Harry M. Blinn, Baltimore, Md., to Doughnut Machine Corp., New York, N. Y. No. 1,855,818. April 26, 1932.

Unit for Forming and Frying Doughnuts—Ira S. Mosher, East Orange, N J., to Joe Lowe Corp., Brooklyn, N. Y. No. 1,855,922. April 26, 1932.

Doughnut Forming Machine — Ira S. Mosher, Chicago, Ill., to Joe Lowe Corp., Brooklyn, N. Y. No. 1,856,042. April 26, 1932.

Adjustable Doughnut-Forming Machine—Fred L. Schoel to Gem Doughnut Machine Co., Inc., Waterloo, Iowa. No. 1,856,511. May 3, 1932.

Confectionery

Process for Recovering Fats and Alkaloids From Cocoa Powders—John W. Livingston, Kirkwood, Mo., and Max Luthy, St. Louis, Mo., to Monsanto Chemical Works, St. Louis, Mo. No. 1,855,026. April 19, 1932.

Standardized Invertase in Dry Form Prepared by Drying With Dextrose or Lactose—Leo Wallerstein to Wallerstein Co., Inc., New York, N. Y. No. 1,855,591. April 26, 1932.

Standardized Invertase in Solution Form—Leo Wallerstein to Wallerstein Co., Inc., New York, N. Y. No. 1,855,592. April 26, 1932.

Puffed Candy Made by Reducing Pressure on Candy Pieces Containing an Inert Gas—George W. Greenwood, Wilmington, Del., to Stephen F. Whitman & Son, Inc., Philadelphia, Pa. No. 1,855,670. April 26, 1932.

Chocolate Molded Into Blocks or Plates in Manner That They May Be Removed From Molds Without Breaking—Henry L. Borg, Stamford, Conn., to General Foods Corp., New York, N. Y. No. 1,856,153. May 3, 1932.

Chocolate Liquor Defatted by Centrifugal Force—Lee H. Clark, Haverford, Pa. No. 1,857,430. May 10, 1932.

Dairy and Egg Products

Ice Cream Portions Made Cone Shape by Freezing in Removable Form—Vincent M. Orear to Ardee Patents Corp., Evansville, Ind. No. 1,859,046. May 17, 1932.

Sanitary Vent for Gravity Milk Tanks—Frederick G. Thwaits, Wauwatosa, Wis., to the Heil Co., Milwaukee, Wis. No. 1,859,479. May 24, 1932.

Machine for Grading Liquid Eggs in Which Egg-Containing Cups May Be Discharged to Either Side of Conveyor—Iphus H. Hall, Winnipeg, Manitoba, Canada. No. 1,860,358. May 31, 1932.

Mechanical Means for Cutting Slabs of Ice Cream Containing Sucker Sticks Into Equal Parts—Harvey A. Beilgard, Hollywood, Calif. No. 1,860,646. May 31, 1932.

Ice Cream Prepared by Freezing on External Surface of Drum, From Which It Is Removed by Scraping—John H. Gardner and Charles A. Sawtelle, Detroit, Mich., to Gardner Freezer Corp., Lancaster, Ohio. No. 1,861,082. May 31, 1932.

Milk-Filled Cans Tested for Leaks by Use of Compressed Gas—Richard M. Garrett, Yonkers, N. Y. No. 1,858,547. May 17, 1932.

Fruits and Vegetables

Vegetable Washing Machine—Eugene E. Edenharder, one-third to Helen E. Edenharder and one-third to Jacob E. Edenharder, West Allis, Wis. No. 1,857,444. May 10, 1932.

Jellylike Product From Sugar, Water, Pectin and an Organic Acid—William A. Rooker and Victor E. Speas to Speas Manufacturing Co., Kansas City, Mo. No. 1,858,374. May 17, 1932.

Pectin Prepared From Fruit by Removing Natural Sugars, Treating Remaining Pulp With a Solvent, Digesting With a Diastatic Enzyme, and Treating With Alcohol—Robert Douglas, Rochester, N. Y., to General Foods Corp., New York, N. Y. No. 1,858,820. May 17, 1932.

Meat Packing

Metal Smoke Stick for Frankfurts — Johan August Kellermann to Industrial Patents Corp., Chicago, Ill. No. 1,859,040. May 17, 1932.

Refrigerated Barrel-Like Container for Shipping Meat—Carl L. Lohner and John E. Covey to Industrial Patents Corp., Chicago, Ill. No. 1,856,920. May 3, 1932.

Machine for Opening Oysters — Henry Robinson, New York, N. Y. No. 1,857,872. May 10, 1932.

Miscellaneous Products and Processes

Method for Making Extract and Subsequently Flavoring Beverage in Continuous Manner—U. G. Todd to Pfaudler Co., Rochester, N. Y. No. 1,856,979. May 3, 1932.

Die for Producing Fusilli-type Macaroni—Daniel Maldari, Brooklyn, N. Y. No. 1,857,313. May 10, 1932.

Ravioli Machine—Sherman Jenney, New York, N. Y. No. 1,858,507. May 17, 1932.

Cereal Beverages Pasteurized by Spraying Pasteurizing Medium on the Bottles—Robert Finlay Graham, London, England. No. 1,859,389. May 24, 1932.

Die for Producing Spiral Macaroni—Guido Tanzi, Brooklyn, N. Y., to Mario Tanzi & Bros., Inc., Boston, Mass. No. 1,859,416. May 24, 1932.

Sugar Juice Carbonated by Continuously Mixing Lime and Juice in the Presence of Carbonated Juice—Elmer R. Ramsey, Larchmont, N. Y., and Arthur W. Bull, Naugatuck, Conn., to the Dorr Co., Inc., New York, N. Y. No. 1,860,321. May 24, 1932.

Copies of Patents

Complete specifications of any United States patent may be obtained by remitting 10c. to the Commissioner of Patents, Washington, D. C.

Photostatic copies of foreign patents may be obtained at the same address, prices being forwarded on application.

Copies of patents should be ordered by number, as titles used in this digest seldom correspond with title of patent.

THE GOVERNMENT PUBLISHES

DOCUMENTS ARE AVAILABLE *at prices indicated from Superintendent of Documents, Government Printing Office, Washington, D. C. Send cash or money order; stamps and personal checks not accepted. When no price is indicated, pamphlet is free and should be ordered from bureau responsible for its issue.*

Chemical Composition of Certain Kinds of Sausage and Other Meat Food Products, by Ralph Hoagland. Department of Agriculture, Circular No. 230.

Varieties of Cheese: Descriptions and Analyses, by C. F. Doane and H. W. Lawson. Department of Agriculture, Bulletin No. 608, Revised; 15 cents.

Cocoa By-Products and Their Utilization as Fertilizer Materials, by G. P. Walton and R. F. Gardiner. Department of Agriculture, Bulletin No. 1413; new printing, no revision; 10 cents.

Construction and Arrangement of City Milk Plants. Department of Agriculture, Bureau of Dairy Industry, Circular No. 228.

Conditions in the Flour-Milling Business. Senate Document No. 96. Federal Trade Commission response to Senate resolution.

Assembling of Butterfat Through Cream Stations. Fifteenth Census of the United States, Distribution of Agricultural Commodities, Distribution No. A-201.

Outlook for the Mackerel Fishery in 1932, by Oscar E. Sette. Department of Commerce, Bureau of Fisheries, Circular No. 10.

Survey of the Mayonnaise, Salad Dressing, and Related Products Industries, 1931, by R. S. Hollingshead and C. E. Birgfeld. Bureau of Foreign and Domestic Commerce, Foodstuffs Division; mimeographed.

Production Statistics From 1931 Census of Manufactures in preliminary mimeographed form for: corn syrup, corn sugar, corn oil, and starch; malt; chewing gum; cane-sugar refining; baking powder, yeast, and other leavening compounds.

Meat Product Specifications, issued by Federal Specifications Board on the following: Sausage, Bologna-Style, PP-S-71; Sausage, Vienna-Style, Canned, PP-S-101; Bacon, Smoked, PP-B-81; Hams, Sweet-Pickle Cured, Smoked, PP-H-71; Hash, Corned-Beef, Canned, PP-H-91; 5 cents each.

Survey of Current Business, Annual Supplement, 1932. U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce; 25 cents. A composite of statistics for nine years; valuable for economic or trade studies.

Tariff Comparisons. U. S. Tariff Commission, unnumbered pamphlet. Relation of duties to value of imports.

Vegetable Oils, Whale Oil and Copra. U. S. Tariff Commission, Report No. 41, Second Series; 20 cents.

Waxed Tissue Paper. Bureau of Standards, Simplified Practice Recommendation R125-31.

Milk and Cream, by A. H. Robertson and F. L. Schacht. State Food Laboratory, Bulletin No. 257. Department of Agriculture and Markets of State of New York, Albany, N. Y. Report on determination of bacteria in milk or cream purchased on basis of bacterial count. Includes law and recommended procedure.

Reducing the Shrinkage of Frozen Fish in Cold Storage, by James M. Lemon. Bureau of Fisheries, Investigational Report 9; 5 cents.